SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE—No. III.

In the GEOLOGY section the present state of our knowledge of the vegetation of the carboniferous age, the controversies produced by certain discoveries, and the advance of scientific opinion respecting them were fully referred to in the address of Prof. W. C. Williamson, the President. Difficulties arise, he says, from the wide differences of opinion among palæobotanists on some fundamental points. On some of the most important there is a substantial agreement between the English and German palæontologists. The dissentients are chiefly, though not entirely, to be found among those of France, unduly influenced by a strong reverence for the views of Adolphe Brongniart. Many disagreements arise from geological differences between the French carboniferous strata and those in our own islands. There are some important types of carboniferous plants that appear to be much better represented among us than in France. Hence we have more abundant material than the French palæontologists possess for arriving at sound conclusions. We have rich sources supplying specimens in which the internal organisation is preserved at Eastern Lancashire and Western Yorkshire, Arran, Burntisland, and other scattered localities. France has equally rich localities at Autun and at St. Etienne. But some important difference exists between these localities. The French objects are preserved in an impracticable silicious matrix, extremely troublesome to work, except in specimens of small size. Ours, on the other hand, are chiefly embedded in a calcareous material which, while it preserves the objects in an exquisite manner, does not prevent our dissecting examples of considerable magnitude. But, besides this, we are much richer in huge lepidodendroid and sigillarian trees, with their stigmarian roots, than the French are. Hence we have a vast mass of material illustrating the history of these types of vegetation in which they seem to be seriously deficient. This fact alone appears to me sufficient to account for many of the wide differences of opinion that exist between us respecting these trees. Difficulty springs out of the imperfect state of our knowledge. Specimens are fragmentary, and present external forms which are somewhat like similarities of sound in the comparative study of languages. They are too often unsafe guides.

The Professor then proceeded to vindicate his own views on certain matters in dispute, and discussing the bearing of the whole subject upon the doctrine of evolution remarked that if there is any truth in the doctrine of evolution, and especially if long periods of time were necesstry for a world-wide development of lower into higher races, a terrestrial vegetation must have existed during a vast succession of epochs before the noble lycopods began their prolonged career. Long prior to the carboniferous age they had not only made this beginning, but during that age they had diffused themselves over the entire earth. We find them equally in the old world and in the new. We discover them from amid the ice-clad rocks of Bear Island and Spitzbergen to Brazil and New South Wales. Unless we are prepared to concede that they were simultaneously developed at these remote centres, we must recognise the incalculable amount of time requisite to spread them thus from their birth-place, wherever that may have been, to the ends of the earth. Whatever may have been the case with the southern hemisphere, we have also clear evidence that in the northern one much of this wide distribution must have been accomplished prior to the Devonian age. What has become of this pre-Devonian flora? Some contend that the lower cellular forms of plant life were not preserved because their delicate tissues were incapable of preservation. But why should this be the case? Such plants are abundantly preserved in tertiary strata, why not equally in palæozoic ones? The explanation must surely be sought not in their incapability of being preserved, but in the operation of other causes. But the carboniferous rocks throw another impediment in the way of constructors of these genealogical trees. While carboniferous plants are found at hundreds of separate localities, widely distributed over the globe, the number of spots at which these plants are found displaying any internal structure is extremely few. It would be difficult to enumerate a score of such spots. Yet each of those favoured localities has revealed to us forms of plant life of which the ordinary plant-bearing shales and sandstones of the same localities show no traces. It seems, therefore, that while there was a general resemblance in the more conspicuous forms of carboniferous vegetation from the Artic circle to the extremities of the southern hemisphere, each locality had special forms that flourished in it either exclusively or at least abundantly, while rare elsewhere. We can only hope that time will bring these now hidden witnesses into the hands of future palæontologists. Meanwhile, though far from wishing to check the construction of any legitimate hypothesis calculated to aid scientific enquiry, I would remind every too ambitious student that there is a haste that retards rather than promotes progress, that arouses opposition rather than produces conviction, and that injures the cause of science by discrediting its advocates.

The Geological Age of the North Atlantic Ocean was discussed by Prof. E. HULL, who stated that from the comparisons made, the conclusion was drawn that when the lower silurian beds were being formed the originating lands must have lain over the area of the Atlantic Ocean, that being the region towards which the strata swelled out on either hand, while the replacement of the sediments by limestone indicated the position of the contemporaneous oceans over central Europe and Western America. In a similar manner, dealing with the carboniferous strata, the author showed by a comparison of sections that over the American area the sedimentary strata swelled out in the direction of the Atlantic shore, while they thinned down or passed into limestones in another direction. From these and other considerations, he inferred that throughout the Archæan, the lower silurian, and the carboniferous epochs, the regions of North America on the one hand, and of the British, Irish, and Western Europe, were submerged, while a large part of the North Atlantic area existed as dry land, from the waste of which these great formations had been built up, and he urged that if such were the case the doctrine of the permanency of oceans and continents, as tested by the case of the North Atlantic, fell to the ground. The President and Prof. Boyd Dawkins concurred with Prof. Hull's views. Dr. Carpenter considered that the bulk of the sea below the present sea level was to the bulk of the land somewhere about 29 to 1. He thought, taking the elevation of the different continents altogether, an elevation of 1000 ft. might be considered as about the average. On the other hand the depression of the great oceanic area below the level of the sea might be stated at an average of about 13,000 ft. The elevations of land which in any way approached the same height were ridges, and one of the most remarkable facts brought out by the Challenger research was that there was strong reason to believe that all oceanic islands were volcanic. In all their researches they found no indication of submerged land over these areas. Prof. BLAKE, in opposing Prof. Hull's theory, observed that there was nothing to support the argument that limestones were necessary indications of deep water.

The Eozoon Canadense, the supposed oldest fossil found in limestones of northern rocks known as Laurentian, whose claim to be regarded as a fossil is doubted by many because no other undoubted fossil has been found with it, was the subject of a communication by Principal J. W. DAWSON, of Montreal, who said that the lowest Laurentian rocks of North America be regarded as a portion of the earth's original crust, or as a deposit thereon by aqueo-igneous agency and without any evidence of derivative deposits. The rocks overlying them gave evidence of ordinary atmospheric erosion of the older rocks and of ordinary aqueous deposition; in these rocks the eozoon occurs. In still higher strata eozoon also occurs here with indications of worm-burrows and of other obscure fossils. With reference to the mode of preservation of eozoon it was stated that in its ordinary condition, as mineralised by serpentine, it presents the simplest kind of mineralisation of a calcareous fossil, that in which the original calcite walls still exist, with no change except a crystallisation of the calcite common in the fossils of newer formations, and with the cavities filled with a hydrous silicate which was evidently in process of deposition on the sea-bottom on which eozoon is supposed to have lived. Commencing with this fact, Dr. Dawson proceeded to show that the various imperfections and accidents of preservation observed in eozoon was precisely parallel to those observed in palæozoic and mesozoic fossils. Dr. Dawson stated that he and Dr. W. B. Carpenter had recently made many new observations which would shortly be published. In the museum of M'Gill University, Montreal, there is a large collection of specimens, which can be inspected by members next year.

The Recent Earthquake in the Island of Ischia was discussed in two papers by Mr. JOHNSTON LAVIS referring respectively to the earthquakes of 1881 and 1883. The papers had been read by the Rev. D. S. Haughton, of Trinity College, Dublin, who supplemented them by making mathematical calculations in connection with the Calabria earthquake. The conclusion arrived at was that it was a slight earthquake with its origin near the surface; the bad material and the style of the houses contributed to their ruin. The isoseismals show that the axis of greatest violence was not perpendicular, but inclined. Ischia was an old submarine volcanic cone, surmounted by a large crater denuded on the south. Since its upheaval at successive periods from beneath the sea it had given birth to a number of eruptions from lateral or parasitic craterets. Some of these had appeared in historic times, and had been preceded by a series of violent earthquakes. The town of Fontana occupied the centre of the great or northern crater of Mount Epomeo. With an active volcano the radial fissure extends outwards from the chimney, but at Ischia the canal has doubtless been plugged up by a mass of trachyte that for thousands of years has been able gradually to roll from the surface downwards. The fissure would have a tendency to branch out, forming an angle with the main axis, and extending itself by spasmodic ruptures, followed by immediate ejection of igneous matter, and would not send the maximum impulse perpendicularly upwards, but inclined. Fontana was not included in the isoseismals, and yet suffered severely. The explanation appeared to be this:—Fontana occupied the centre of the great crater of Epomeo, and therefore lay immediately over the old chimney which, in all probability, was filled by an old plug of trachyte which must descend to the igneous reservoir. Any increase of tension in a general mass of igneous matter that might determine the further rupture of a collateral fissure would result in the conduction of any changes of pressure or vibrations along the column of highly elastic trachyte, while the same earthwaves would be annulled or absorbed by the inelastic tufas surrounding it, so that the blow would be struck perpendicularly to the surface, and in a small area with well-defined borders. The earthquake occurred at an epoch of general seismic activity throughout Europe. At Naples and Vesuvius the most delicate seismographs were undisturbed. This was intelligible considering the geology of the district. The earthwave would be refracted and reflected every few yards, besides being absorbed by the inelastic medium. Prof. Haughton had calculated from projected objects the molecular velocity which turned out to be 4·6 ft. per second. The velocity of transmission could not be obtained, partly on account of the imperfect time kept.

NOVEL COLLIERY ACCIDENT.—A curious Press error is referred to by a correspondent of Notes and Queries. The Standard of Sept. 21 reports that—"The remains of the late Mr. John Payne Collier were interred yesterday in Bray churchyard, near Maidenhead, in the presence of a large number of spectators;" with other particulars. In the Eastern Daily Press the announcement appears as follows:—"The Bray Colliery Disaster.—The remains of the late John Payne, collier, were interred yesterday afternoon in the Bray churchyard, in the presence of a large number of friends and spectators." So much for literary reputation at the age of 94.

THE IRON AND STEEL INSTITUTE.

Continuing my remarks upon the meeting of the Iron and Steel Institute at Middlesborough, I may state that on Thursday several papers were read in connection with gas puddling and other matters connected with the iron trade, and interesting discussions ensued thereon; after which the members left by special train for Stockton, where several hours were spent in inspecting the rolling-mills and other works in that important district. The blast-furnaces and rolling-mills, &c., at the Thorneby Works of Messrs. Whitwell attracted much attention. On Friday there were no papers, but an excursion was made to inspect the Tees Improvement Works. The Tees Conservaney Commission was established in 1852, with a jurisdiction over 8000 acres. Since that time the river has been dredged from Stockton to the sea, and the depth increased from 2 ft. to 11 ft. at low water, and walls constructed for a distance of 10 miles on each side. These walls have been constructed of slag from the furnaces, the total quantity of this material used having been about 2,000,000 tons. A breakwater has also been constructed, 2¾ miles in length, from solid slag blocks, each weighing 3 to 4 tons, which has been in progress since 1863. In carrying out these works there has been reclaimed from the estuary of the Tees 2600 acres of land, from which a revenue has been realised of 106,962*l*. A large number of members joined an excursion to Crook to examine the collieries and plant of coke-ovens on the Simon-Carvès system belonging to Messrs. Pease and Co. The South Durham coal field is the most prolific in the world, the output of coal in 1882 being close upon 22,000,000 tons. Of this quantity the firm of Messrs. Pease raised nearly 1,500,000 tons. The firm has 1882 coke-ovens, producing about 700,000 tons of coke per annum. A number of iron and steel works were also visited by the members in the Darlington district.

The papers on the New System of Coke-Making, by Mr. Dixon and Mr. Jameson, have been published in the Journal. The Simon-Carvè's system, it will be seen, is very costly—that is, the first cost of the apparatus—but the results appear to be marvellous; the yield of coke is 77 per cent. of good coke and 27·70 gallons of ammoniacal liquor per ton of coal, and tar 6·12 gallons per ton of coal. The Jameson process is much less costly, and it has been found that by this process coals of various kinds can be coked which will not coke by the old process, and also a fair quantity of oil, &c., can be recovered from them. The Jameson process yields 67 per cent. of good coke with the Brancepeth coal, which is a good coking coal, from one of Messrs. Straker's and Love's collieries; 5 gallons of oil per ton, and 3 lbs. sulphate of ammonia per ton. The great cost of the Simon-Carvè's system will deter many of the cokemasters from adopting it; at all events, they will wait until further experience is gained in its working. The moderate cost of the Jameson process will cause it to be more rapidly adopted. At Page Bank Colliery some ovens are already in regular work on this system. The system has been adopted at Tudhoe Grange Colliery. Many of the great coke manufacturers are apprehensive that if these systems are carried out extensively the production of ammonia and other bye-products will be very great, and that the value of these products will consequently be seriously reduced. There may be some reason for these apprehensions, but it is stated by well informed persons that the demand for ammonia for agricultural purposes is practically unlimited. We may notice that at Felling a large quantity of gas is got by the Jameson process, and this gas is worth at that place 3s. per 1000 cubic feet. Of course in some localities gas produced will be of less value,

Original Correspondence.

THE ST. JOHN DEL REY TAILINGS.

Sir,—Will you kindly allow me to correct some statements of an occasional correspondent of yours, under the name of "Minas," as he has made use of my name in connection with working the tailings of the St. John del Rey Mining Company. He says—"I have twice before expressed my opinion on this tailing business. I do not know of one who has made money for the company or more than a living for himself." I would not trouble you in the matter, but as he has seen proper to make statements that are unreliable I should like to correct them, preferring my judgment and knowledge of mining to that of "Minas." As regards experience in the working of tailings allow me to name only a few of the localities in which I have been engaged in the working both of tailings and sulphurets by amalgamation, chlorination, and lixiviation—first, in 1848, at the Santa Maria Mine, in Babopitas, Chinaavola, Mexico; secondly, at the tailings of the Mina Rica de los Flores, West Point Mining District, county of Calavera, California, and again at the Big Blue and Sumner Mine, Kern county, California; thirdly, at the Ferguson and Wallace Mine, Sheep Ranch, Calaveras, in California; fourthly, at the Calaveras Mine, Indian Creek, Calaveras; fifthly, at the Soulsby Mine, Tuolumne county, California; sixthly, at Burdsett and Company's Tailing Mill, Dayton, in the State of Nevada; seventhly, at the Vulture Mine, in Arizona. In all of these I can appeal to living witnesses, persons who own or used to own these mines at the times when I was working the tailings in them, who will at any time certify that I worked them at a profit, giving them from 25 to 65 per cent. of the assay value, and furnishing my own machinery, more costly than that sent out to the St. John del Rey for working tailings.

My dealings have always been thoroughly honest; if they had not I could easily have made a far better contract for myself last year with the St. John del Rey, seeing that so many before me had made failures, whereas in every instance I had worked up to so high a percentage that it would not be necessary to work the tailings over again, except the large accumulated pile which was then on hand. For the result of my experiments last year I beg to refer you to the accompanying letters, which you are at liberty to publish, and would benefit the public by inserting in the *Mining Journal* [Mr. Morris omitted to enclose the letters, but their publication cannot be necessary] should space permit. Should they meet the eye of "Minas," I presume he will admit that his statements were both unfounded and misleading.

From a measurement of the heap and the assay contents at Morro Velho, I should say there is there about 300,000*l.* sterling. If we allow 75 per cent. (which is only a reasonable percentage) for recovery that will give a yield of 225,000*l.* Then if you deduct the cost of machinery, wear and tear, and labour, and allow four years in which to work up the whole heap at an expense of 20*l.* per day, that would give a net profit of 195,800*l.* It should also be remembered that whilst this was going on the retreatment of all the sands during the same time would be worked up to such a high percentage that any further saving of tailings could be dispensed with. The total cost of the whole of the machinery laid down at Morro Velho was no more than 6000*l.*, and it included three of Leffel's turbines, three rock-breakers, one turbine, and eight Morris' settlers for Cuiaba, one turbine for Powles' Mill, and one turbine to take the place of the Hockin wheel at the train works. Now, the cost of this latter machinery should be deducted from the total cost, as you cannot fairly put that to the cost of retreatment of sands, and, therefore, the cost of the retreatment machinery, appears to be only 4000*l.*, a very small sum as compared with propositions that have been made for the retreatment of these sands. At the time when these experiments were made with a view to amalgamation, it was found after stamping that it would be necessary to have friction machinery something like that which I describe in my Theory and Practice in Gold Amalgamation." Now what, let me ask, would have been the cost of 200 heads of stamps in addition to the requisite friction machinery?

Oct. 2. Frederick Morris,
Practical Mining Engineer and Metallurgist.

ST. JOHN DEL REY, AND ITS MANAGEMENT.

Sir,—After a long absence in the North, I find myself looking over the files of your valuable Journal, and see that "Investigator," "Minas," and "Investigated" have been hard at it, and a new correspondent, under the signature of "Facts," gives some hard rubs and ugly knocks to the direction of the St. John del Rey Company, and "Minas" is accused of laying the blame upon the "grand old mine" instead of upon the management. I note that Mr. Tendron at the general meeting made adverse mention of Mr. Gordon for his administration generally at Morro Velho, which doubtless was exceedingly blameworthy, but he does not point out that this had been concurred in by the directors for over 17 years. It is true that Mr. Gordon is no miner, and had to depend upon Capt. Jackson, whose orders were to make the mine give dividends, but this was with the approval of the London board. Mr. Gordon is not responsible for the picking out the eyes of the mine by Jaures, when under Dr. Buchanan's management, during his (Mr. Gordon's) absence in London, and that was certainly no reason for the treatment Mr. Gordon received at the hands of the two commissioners sent to Morro Velho in 1877, and who dismissed him, nor for the insults flung at him when his dismissal was announced at the general meeting. All this may be in strict conformity with the customs and usage of the company, but, nevertheless, it is much to be deprecated.

"Facts" refers to the fire as an inciendiary, yet this can scarcely be justified, since it burnt what would have been too much to serve the projectors' purposes; but doubtless if Mr. Gordon had not, against the advice of Mr. Thomas Treloar, introduced the wooden pillars instead of leaving the natural pillars of the country to support the mine, there would have been comparatively no damage done by a fire taking place accidentally. The official enquiry into the cause was burked, and, like the promised report of the proceedings of the commission to Morro Velho, never saw the light; but, according to the diary of the commission, this is not much loss, being principally details of the obstinacy of Mr. Gordon, and measures of coercion taken against him by the commissioners. "Facts" also refers to the Catta Branca slave case. A partial settlement, much to the prejudice of the blacks, has taken place for the 2½ years they were "*sub judice*," but for the 17 years' wages due from Jan. 1, 1860, to June, 1877, when the deposit was effected, no payment appears to have been made. The blacks still claim this very large sum, which the "conspirators" against their liberty (according to Mr. Hockin) received for them from the St. John del Rey Company out of philanthropy. Why, therefore, does not Mr. Hockin turn up the man or men to whom he so innocently paid this money for so many years after he knew the contract had expired? If he or any of them occassionally came to the office of the St. John del Rey Company it would be easy for him to do this, and then hand the money over to its rightful owners, instead of letting the direction and shareholders suffer the disgrace of having from 200 to 300 nigger creditors clamouring against them for justice. How can the auditors certify the balance-sheets while these claims are outstanding?

I presume it is in consequence of the present apparent lull in the Catta Branca question that Mr. Gordon (or Mr. Slavery Gordon as he has been named) is again in London after his engagement in Canada. His nomination as a first director of the Don Pedro Company is unwise, as he does not claim to be a miner, and as to geology we have the testimony of Mr. Gordon himself—that after having been at Morro Velho and studied the formation for 17 years all he had learnt was that it was a "conglomerate," and he used this designation at a general meeting to describe the Morro Velho in its geological sense, proving his non-acquaintance with the subject upon which he was attempting to enlighten Mr. Jackson, the enquiring shareholder. But let not Brazilian students of geology be scared, the letters F.R.G.S. merely indicate Fellowship of the Geographical Society.

Having been superintendent of Morro Velho will not make a man a miner or give him mining knowledge without long previous training any more than setting in the chair of a professor will give a man the ability to teach a science, or eating German sausages will assist in requiring a knowledge of that euphonious language. It should also be recollected that when Mr. Gordon was superintendent at Morro Velho the Conservatives were in power, for whom he played such hanky-panky political tricks. At present the Liberals rule, and they have not forgotten Mr. Gordon, and might, therefore, use influence against any company with which he is in any way connected; while should he appear here he is liable to be prosecuted not only by each individual Catta Branca black, but by others for having retained them in slavery.

I presume that the alleged mortgage to Mr. Bawden of the properties of the Don Pedro North del Rey Company (which mortgage was at first denied by the managing director, Mr. Dawson) will be thoroughly investigated. There appears to have been no authority from the shareholders to mortgage this property, assuming the mortgage to have been effected, it may be asked, and what has been done with the money? Surely the directors are solely liable for the amount of money so obtained, and not the shareholders. I trust there will be an independent secretary nominated to the New Don Pedro Company, as I notice that companies handled by managing directors sometimes seem more liable to irregularities than where a competent secretary is employed, whose proper duty is to act between the directors and shareholders. Chas. W. Williams.

Rio de Janeiro, Sept. 6.

TIN AND GOLD MINING IN SOUTH AUSTRALIA.

Sir,—In the public journals of the day the Government of South Australia are inviting applications for a loan of one million and a half, for the purpose of constructing two lines of railway, the importance of which on the future development and prosperity of the colony cannot be over-stated. One line now in course of active construction will connect Adelaide with Melbourne, and the other will start from Port Darwin, in the Northern Territory, inland to Pine Creek, a distance of about 200 miles, being the first section from that end, of the Trans-continental Railway towards meeting the Northern line being pushed forward from Adelaide—the distance between the two to be constructed being some 1500 miles.

The first mentioned railway to Melbourne when finished will do more to bring about and accelerate the federation of the Australian colonies than all the speeches on the subject, as the several capitals of Adelaide, Melbourne, and Sydney will then be united by railway. The line from Adelaide will pass through a highly mineralised country, especially for copper, and will enable the well-known Kanmantoo Copper Mines to be extensively worked. These mines are situated in an undulating country, the lodes traversing the side of a low range of hills. They have hitherto been worked in a desultory manner by small companies of working miners down to water level. By the erection of pumping-engines to enable the rich deposits of ore worked away above to be followed below water level, and the erection of the latest improved dressing machinery, together with cheap transit of the ore by rail to Adelaide, these mines will be enabled to make an output of 700 to 1000 tons a month, and realise profits hitherto unobtainable.

The other line of railway from Port Darwin (named after Prof. Darwin, who visited the place when a young man) to Pine Creek, will open up probably the richest country for gold, tin, and other minerals that has yet been discovered. As the mineral wealth and vegetable products of this wonderful territory are almost unknown to those not connected with South Australia, it may interest some of your readers if I give a brief résumé of the same taken from the official reports that have appeared in the Adelaide newspapers during the last three months. For many years past reports of wonderful discoveries have been circulated in Adelaide of the riches found in the Northern Territory of the colony, some 2000 miles away, but owing to the tropical climate, want of capital and enterprise, beyond tentative efforts at prospecting, very little has been accomplished towards real practical development. In the year 1882 the Government wisely decided that the minister, Mr. Parsons, in whose department the management of this part of the territory belonged, should make a flying visit, accompanied by Professor Tate, F.G.S., and other gentlemen, the practical result of the expedition being the authorisation by Parliament of the construction of the before mentioned railway from the port to Pine Creek.

The minister brought back with him samples of the vegetable productions and mineral specimens of the richest description, gold, silver, lead, tin, and copper ores, which I had the pleasure of seeing when in Adelaide a few months since. There were large nuggets from alluvial washings, specimens of quartz completely studded with gold, and also some auriferous earth from a "Mullock" leader, which yielded over 5 ozs. to the ton. The tin was principally stream, and the copper rich carbonate of 50 per cent. Some of the specimens of auriferous quartz were brought from the Margaret and Yam Creek claims. Those from the Margaret were taken from about 6 tons of quartz, which when crushed yielded over 220 ozs. of gold. Those from Yam Creek gave 5 ozs. to the ton, and after the extraction of all the free gold from the stone by the usual process the arsenical pyrites gave by assay at the rate of 150 ozs. to the ton.

At the Lady Alice claim some of the quartz has produced as much as 8 ozs. to the ton, the average being about 2 ozs. The North Lady Alice 80 tons gave 400 ozs. The South Lady Alice, held by Chow Sing and other Chinese, 100 tons gave 3 ozs. to the ton. At the Telegraph claim 10 tons produced 250 ozs. At the Extension Union 26 tons gave 40 ozs. At Bridge Creek the alluvial diggings yield from 3 to 8 ozs. to the ton. At the Elizabeth claim a first crushing of 20 tons obtained near the surface yielded at the rate of 1½ oz. to the ton. A second crushing of 40 tons gave 6 ozs. to the ton, and a third of 50 tons yielded 5 ozs. to the ton. Two separate crushings of 50 tons each taken from two other reefs on the same claim gave 4 ozs. to the ton. At the Pender Hill claim 30 tons gave a trifle over 1½ oz. to the ton. The following figures give a return of the stone crushed at the Spring Hill battery from September, 1882, to April, 1883, inclusive:—Public crushings—Three Legs, 34½ tons crushed 20 ozs. 13 dwts. 9 grs. yield; New Era, 25 tons, 41 ozs. 10 dwts. 10 grs.; East Clifton, 31½ tons, 82 ozs. 11 dwts.; total, 91 tons 144 ozs. 14 dwts. 19 grs. Company's crushings—18 tons crushed, 29 ozs. 13 dwts. yield; 11 tons, 23 ozs. 8 dwts.; 183 tons, 274 ozs. 17 dwts.; 34 tons, 71 ozs. 5 dwts.; 165 tons, 263 ozs. 18 dwts.; 104 tons, 161 ozs. 3 dwts.; 163 tons, 268 ozs. 8 dwts.; 153 tons, 209 ozs. 17 dwts.; 130 tons, 177 ozs. 14 dwts.; total, 961 tons, 1480 ozs. 3 dwts. By this return it will be seen that 1½ oz. to the ton has been crushed throughout the season. At the Grove Hill Company's claim at Yam Creek the last clean up was a little over 13 ozs. to the ton. At the Old Christmas Reef 62 tons gave 105 ozs. At the Alta Union claim the stone crushed never went less than 5 ozs., and frequently as high as 15 ozs. to the ton. The Union Prospectors' claim 10 tons gave 77 ozs., and the North Union yields from 2 to 27 ozs. to the ton. The metalliferous lodes are found in the metamorphic rocks, the quartz veins occurring in felspathose sandstone.

Stream and lode tin has also been discovered in several places, notably at Mount Wells, and recently near Mount Shoobridge. An account of the wonderful rich lodes at the latter place appeared in the Journal on Sept. 15. These lodes have been traced on the surface for several miles. The discovery was originally made by Mr. Barrett while out kangaroo hunting. He saw what looked like a wall some 10 ft. high, 8 ft. wide, and extending for 30 or 40 ft. in length, glistening in the sun. On inspection it proved to be composed of quartz and talc, thickly interspersed with black specs and nodules, which turned out to be black tin assaying 70 per cent. At this spot there are two champion parallel lodes standing upright out of the ground as above described, the surrounding country having been in the course of ages washed away from them. Judging from the large blocks of ore sent to London it is probable that this is the richest discovery of tin ore that has ever been made in any part of the world. The fortunate proprietors are not at present doing much to further develope the lodes beyond continuing surface prospecting, as they have already raised large piles of ore worth several thousand pounds, waiting for the necessary machinery to dress it for market.

Besides being rich in minerals, this favoured country produces the richest kind of saccharine sugar cane, indigo, cotton, maize, arrowroot, tapioca, several oil nuts, pine, and rhea fibre, cinchona, sarsaparilla, banana, tamarind, and many other valuable products. This part of South Australia has been said to be the land of grasses, the number of known species found there being about 130. Two kinds, the anthistiria and the andropogon triticeus, not unfrequently acquire an exuberant growth on the flats, reaching a height of 6 ft. to 8 ft., and exceptionally attain to 14 ft.; but on the hill slopes the same species dwindle down to less than 2 ft. The foregoing brief description of the products of this part of South Australia will show the productiveness of the soil and the wonderful mineral wealth of the rocks—the one waiting to be cultivated by the spade, and the other to be worked with pick and gad. When the railway is constructed and both are developed it requires no prophet to predict the wealth and prosperity that will accrue therefrom. T. A. Masey.

Oxford Mansions, W., Sept. 27.

CORPORATION OF SOUTH AUSTRALIAN COPPER MINES.

Sir,—Now that holidaying is over more attention is likely to be given to mining matters, among which the above company should come in for a fair amount of attraction. This company is going its third year of development, and now that water in quantity has been obtained to be relied on it must no doubt show good tokens of industry, and some profit soon certainly. It is evident that ore in immense quantity is forthcoming, and that of the highest grade, which as a consequence must leave a substantial profit, but whether the patience of the shareholders are to be rewarded this year or next is a matter of conjecture.

I notice that in New South Wales a gold fever has evidently set in over recent discoveries. This company possesses property which, if it were carefully prospected, cannot (I should think according to Dr. Ulrich's report of 1872) fail to repay richly for so doing; indeed, I believe certain miners were found but a year or so ago cradling in the creeks close on the property, making no doubt a decent living out of the sand and rock. This company is of course a copper company, and as such has rightly given this its first attention, but I do not now see why some inducement should not be held out to some (say) of its miners or other prospectors to thoroughly search for such an object. Geologists sometimes fail or err, but taken along with the fact that these miners were there it is certain evidence that gold has been, and is being, washed down from the highlands which form part of this company's holding. This is simply a material object that should not be lost sight of by the staff in Adelaide at present. Again, so far as one can see, there is now every prospect of sufficient water being obtained for the mines purposes. May the shareholders (seeing that a yearly meeting is only held) not be favoured with a quarterly return of ore, expenses and profit, or (say) a monthly return, which would be better.—*Leith, Oct. 2.* Desideratum.

KAPANGA GOLD MINE.

Sir,—This morning I had a circular intimating that an extraordinary meeting of the shareholders would be held on Tuesday "to take into constderation the present position of the company." The circular as worded leaves the shareholders in doubt as to the present position of the company, and the reason for such an exigency so shortly after the annual meeting proves either financial embarrassment or unsatisfactory management. Both seem from the latest reports to require the attention of the shareholders, and I would suggest that a committee of six qualified men be empowered to investigate the affairs of the company since its reconstruction, with power to examine the items of disbursements, telegrams, commissions, and the proper construction *bona fide* extracts from Mr. Thomas's letters and reported to the *Mining Journal*, as well as the dealings prompted by telegrams based on the previous advices by letter.

It will be invariably found, at least I say from experience, that where there are a number of mines in an office seldom any one of them prove successful, and the officers of such mines through liquidation often realise better results than by having an annual income. In mining once an order is obtained to wind-up voluntarily the shareholders never receive even a statement, the surplus being swallowed somehow. Your correspondent last week in a letter headed —"How to Form a Board of Directors" proves the maxim—"Since man to man is so unjust we must be careful who we trust." The present position of Kapanga Company warrants now united efforts, and a board of directors above suspicion to preside over its affairs. The monthly reports should be carefully checked and published *verbatim*. As a large shareholder I am willing to aid in any well-digested scheme, and have contributed and taken up all calls or shares allotted to me; but at a juncture like the present with probably effete directors I think some investigation is necessary to warrant at least confidence.

Yuba River Mine, same office, I hear is in trouble, although the letters, reports, &c., were circulated in the *Mining Journal* showing its enormous wealth. *Commercial-road, Oct. 3.* D. D.

NEW CALLAO COMPANY.

Sir,—This company seems to be leading a quiet, sleepy life. I daresay, after being so nearly strangled by foul means out of existence, there is an endeavour to re-establish its health in a leisurely way. Those interested therein, however, are now wondering if the patient is really gaining material strength, and when will he give signs of a healthy vigour. Certainly it is high time some token was forthcoming, or the patient must surely go into a serious decline from want of inherent recuperative strength. Now, great things were hoped of therefrom; but, alas, "hope deferred maketh the heart sick." I fancy the great medicine, £ s. d., is so scarce and difficult to obtain by his nurses that, as a consequence, it must be as sparingly administered to the patient, the natural result being the recovery is mortal slow. As one interested I certainly would rejoice to hear from some authentic source regarding this patient; and if, with the approach of the end of another year, one may reasonably hope that the patient will throw off that laxity and mystery that seems surrounding its industry and material welfare. Cannot those sincerely interested get a little more intelligence at less distant periods?

Leith, Oct. 2. Desideratum.

CHINESE LABOUR IN BRAZIL.

Sir,—It appears that the introduction of Chinese labour into Brazil has not been such an unmixed advantage as it was anticipated it would be. In proof of this I subjoin a letter from the Superintendent at Morro Velho, published in the Jornal do Commercio, of Aug. 26.—*Cocaes, Sept. 2.* W.

To the Most Illustrious and the Most Excellent Dr. Ignacio A. de Assis Martins.

Dear Friend and Sir,—I have to acknowledge receipt of the esteemed favour of your Excellency, with date of 11th inst., and in reply have the honour to inform you that the number of the Chinese actually engaged in the service of this company is 105. Besides the food and mine clothes which the company is obliged to furnish them under the clauses of the contract, they daily gain Rs. 1000 (say 2s.) more or less for eight hours' service. With some exceptions they are not much inclined to work, and need much looking after by the feitors (drivers.) In my views these people have proved very expensive, and caused much inconvenience to the company, those from Saigon being the worst. Complimenting your Excellency, I have the honour to subscribe myself with all esteem and consideration, your Excellency's friend and obliged servant,

Morro Velho, Aug. 17. George H. Oldham, Superintendent.

GUINEA COAST GOLD COMPANY.

Sir,—Considering that the Chairman of this company must have made a profit of from 1000*l.* to 1500*l.* out of his share of the Syndicate gains, and that his fees as a director will go a great way towards repaying him the outlay for shares to qualify him for the directorship. I hardly see how he can feel "just as much disappointed" as the shareholders, and I am one who paid 1*l.* per share for hundreds of shares now absolutely valueless, and without any prospect whatever of ever returning a shilling to the holders.

The fact is this was a case so far as the Chairman was concerned of "Heads or tails I win." He may not have won as much as he hoped

and expected, but he has done pretty well. As for myself I should be very glad to see back a fourth of my money. R H. P.
New Broad-street, Oct. 4.

GUINEA GOLD COAST MINING COMPANY.

Sir,—If it be true, as hinted by correspondents in the *Mining Journal*, that the concession purchased by this company is not what it was represented to be, it is to be hoped that a most searching investigation—which the directors would, no doubt, court—will be made into the manner in which this company was floated. It should always be remembered that if the discovery of delinquencies does not result in the recovery of the amount paid for a "mine"—as it sometimes does—it is at least satisfactory to expose the persons and the whole proceedings connected with the matter if they were not perfectly *bona fide*. Such an exposure at least benefits the public by preventing men of supposed respectability from connecting themselves with concerns that are not perfectly straightforward and honest, and thus allowing themselves to become decoy ducks to the investing public. I shall be happy to do what I can to further this object.—*Worcester, Oct.* 3. A. R.

MINERAL GROWTH—GOLD AMALGAMATION.

Sir,—I had thought your readers had been bored through and through with these subjects, and desired no more of them. As to mineral growth—or "molecular movement," as some prefer to call it—I may say that I have unremittingly pursued researches thereon, and every day almost gives proof upon proof that my heretofore "idiotic notion" is nothing more nor less than natural truth of a very common order. It is true, also, as you note, that my "statements have been supported by other scientists." Indeed, I have received a good many assuring communications thereon from different parts of the world. It is, however, a trifle to smile at, that certain *savants* who were loudest and most authoritative in their pronouncements as to the "total absurdity" of the mineral growth idea have turned sharp round on me with the equally authoritative declaration that "the fact has nothing new in it," and that, in short, "it is as old as the hills."

Now, it happens that this is exactly what I have talked and written about it in the *Mining Journal*, the Mineralogical Magazine, and elsewhere, ever since I knew of it. There is certainly, as they say, nothing new or rare in the fact of mineral growth, yet the reobservation of it had to face another simple fact—every living man did not know of it at the time I ventured to speak about it. Certainly, mineral growth has been going on from "the beginning," although nobody, I fancy, has the faintest idea, or will hazard a guess, as to when that epoch happened to be. Professor Cayley says, "It may be said that a change of any kind takes place only in time" (obviously meaning the time-of-days), excepting, of course, the changes considered in mathematics. I beg to submit a thought that the changes which formed the hills in which the mineralogical growths referred to take refuge have nothing whatever to do with time-of-days until we indefinitely and inappropriately attempt to apply it thereto. Mineral growth, therefore, as I view it, is far older than the hills, and must have had its genesis at a very incomprehensible remoteness from the period commencing with inexact day-reckoning.

The *what* in this instance is provable, the *when* not so; and so probably will ever remain. The past time has always bothered brain; even time present is difficult to manage. In your note underlies a desire to know what I am at as to mineralogy. Well, Sir, I am still a loving observer of mineral substances of all kinds, and the beautiful valley of the Mawddach alone affords charming work for a whole lifetime, even if begun in swaddling clothes. I have before me metallic growths of surpassing interest that are not a month old. It is absolutely certain that no human eye ever rested on the matrices out of which they have come until the last fortnight or so, when they were first brought to the light of day at my own bidding; indeed, the facts as to mineral growth are so constant and have become so familiar to me, that I now seldom trouble to make note thereon. In truth, I can only deliciously admire the indubitable facts I see and handle, and rouse occasionally the genuine admiration of others by their exhibition.

Sundry persons to whom, two or three years ago, I gave electrum quartz specimens so that they might themselves watch progress, if any, have assured me that the gold increase thereon in instances is very palpable. Others assert positively that theirs remain in *statu quo*. Likely enough. All natural stir, perhaps, is irregularly periodic, and not always easily to be discerned when it happens, particularly by a type of eye which sometimes seeing see not. Apart altogether from commercial considerations the subject of mineral growth is of the intensest interest as affording material data for speculations on the earth's mineralogical history. On economic grounds the subject is also of some importance, for the liberation of the precious metals in particular by natural operations is sure ultimately to command more attention than it has hitherto. They are more or less desired by everybody, and the desire is not likely to go out of fashion for a long time to come. Besides, the scramble for them is so enticingly interesting.

As in mathematics, recently put by the President of the British Association for the Advancement of Science, "the notion of continuous variation is a very fundamental one;" so I claim for mineralogy the idea that the earth's crust (as it is called) is subject to continuous variation, having a liking, on state occasions, for geometric relations, as if in artistic decoration of its generally amorphone states of being. At this moment the cosmic dust of Greenland appears to be little thought of, as associated with the earth's variations; but it would not surprise me in the least if shortly something of importance grew out of it through the thoughtfulness of that distinguished philosopher, Baron Nordenskjiold. You interest me greatly by citing Dr. Fleitmann's observations "confirming the view that the formation of mineral veins requires much less time than has usually been supposed." I have myself, as an amateur, had measurable proof that abandoned "sinks" in quartz veins, sometimes after the lapse of, say, 15 or 20 years have become of considerably smaller dimensions than at their origin. It would be of use if some of your readers, who have had large experience of quartz mining, would corroborate this.

There used to be a Flintshire tradition of a ladder, plank, and shovel having been found embedded in a quartz vein. Assuming this to be fact, it requires very little reasoning to determine that the quartz (if quartz) had a more recent origin than the wooden things. And it would be unnecessary to go so far back as the pre-Adamite man for the maker of a mining ladder. A visitor to Bateman's works at East Greenwich may any day see flintstones cooked into a treacle-like fluid for emery-wheel making; of which, pre-supposing the clay figures Dr. Fleitmann alludes to, quartz veins could easily be made. Yet the soluble silica found somewhere near Bagshot, in Surrey, introduced to me by Prof. Way a long time ago would effect the same formation, easier, perhaps.

As suggested in the note referred to, it is perfectly true that the iron sulphide varieties are sometimes very rapidly formed, and undergo speedy changes other than crystallisation proper. Some of the pyritous changes may be called sportive. A few years ago I found in lower silurian unclearable slate what had evidently been an isometric pyrite cube, and, of course, iron sulphide as to composition. It had afterwards become changed to limonite (as I got it), somewhat flattened, and neither isometric nor a sulphide. Around this changed thing, or natural variation (pseudomorph some call it), had accumulated, I think rapidly, a plastering, so to speak, of quartz, arranged thicker in places, so as to build up a crystal of the regular quartz type! There is, verily, a sermon in this mineral. The specimen has undergone no change, that I know of, since I had it, except that I carelessly broke off one of the faces to see if the accretion was a quartz fact or not, and a sceptical friend (?) chipped off another face to verify me. I must re-assert that such occurrences as these cannot possibly be so rare as they seem. For aught I know to the contrary at present, they may not be infrequent in the locality where this, to me, most interesting specimen was found—at the Precipice Walk, near Dolgelly, where venturesome tourists require no special exhortation to walk circumspectly. To conclude, I assert that the spontaneous growth of gold, silver, and copper from their (commonly called) non-metallic matrices, and the sulphurous ores of iron, lead, and zinc, is a natural history fact, provable as easily as anything else that is thought to be more common.

As to my amalgamating process: Some do not approve of it, because it refuses to extract gold from minerals that contain none; others, strangely, on the contrary, because, practically, it gets out all the amalgamable gold in the ores; others, because it threatens interference with the gold-assaying business; others disapprove because they are mentally too poor to afford to give up received (and with difficulty retained) opinions and preconceived prejudices; others on account of its simplicity, and as requiring only unskilled labour in operation. The process is at constant work not far from Dolgelly, and may be seen by anybody interested in gold extraction. I should, however, say that the operations are being carried on privately as a crucial test upon most refractory minerals, and have no reference to any company whatever.

Somebody enquired lately the known gold yield of Merionethshire. It is 14,667 ozs. from 12,137 tons of quartz, about 40 tons of which yielded 9363 ozs., in which I satisfactorily participated at the time.
Dolgelly, Oct. 3. T. A. Readwin, F.G.S.

MINING ECONOMICS—HOW TO EARN PROFITS—No II.

Sir,—I proceed, as intimated in my last letter, to discuss the objection as to time alleged in opposition to investments in young mines, and shall premise at the outset that time is as money in respect of this industry: This implies convertability of terms—what time is to money, money is to time; each commodity has a relative and a comparatively circumstantial equivalent of value. If the abridgment of time in pursuance of an object accelerates its acquisition or attainment, the question from a financial point of view is as to whether or not the abridgment of time was or is a sufficiently compensating consideration for the additional expense incurred in its prosecution. In the matter of mining, and in respect of our present purpose, additional expense prior to or intended may be safely presupposed as the gist of the maxim that "time is money." This is a question which in its general significance and minutæ would involve an extensive and intricate discussion. But my purpose is a limited one—restricted to the consideration of the different phases of two or more classes of mines.

The axiom that "time is money" can only avail when the abridgment of time in pursuance of an object proves to be, at least, the equivalent of value of the extra expense in its attainment. In respect of the class of mines which we are considering—the sensational and the solidly indicated class, the saving of time is relative only to natural dynamic conditions—disturbing forces, resulting in special peculiar or abnormal effects, in the one instance, and the absence of those ultra-extraneous forces in the other. The formation of metalliferous mineral appears to have no dependence on or connection with the activity or non-activity of such forces abstractly considered; but on a curriculum of Nature, which apparently connect only with the empire of dynamic force by a series of chains—so to speak the igneous rocks—whether locally, consecutive, or otherwise. The precocity of metalliferous channels, whether of veins or caverns, induces or ought to induce suspicion of eccentricity, and experience goes far to establish the rule that eccentric phenomena and their effects are most unreliable. The engrossing influence of large bodies of metallic ores at or near the surface is almost irresistable to more than one class of persons—such as the avaricious speculator, whose ambition is to lay down a penny and to take up a pound as a mere matter of exchange quickly; also the designing manipulator of mines, whose sole purpose is to elaborate his superficial wares for display in order to intoxicate and entrap the unwary by the ingenious exhibition of an exaggerated spurious product, the sequel of which is soon arrived at and determined—the immediate prelude of disappointment, heart-burning, and repining. Time is money was the infatuating talisman, and time and money in such instances are symmetrically evanescent. There is another and a better sense in which time and money are the more rational and satisfactory equivalents of each other. I mean where time becomes the current substitute of money, its conservator, and practical representative. If by comparatively inexpensive arrangements during the process of a definite or really indefinite period of time one's exchequer is handsomely replenished with but little previous appeals to its contents it seems far more consistent with ordinary reason and the stern logic of events to say in respect of such an enterprise that time was money in the truest sense of the term. If the currency of time promotes the acquisition of money and its realisation in a ratio satisfactorily corresponding to the period of its duration, avoiding the expense incidental to its abridgment by the payment of an exorbitant premium, which after all may or may not be productive of any increase or of even its own stability or recuperation, it unites safety and certainty, and thereby becomes the legitimate motto of progressive enterprises, and especially those of mining. Another thing to be remembered is that many if not most of the sensational class of mines said to be developed are not developed at all, or prospected beyond the alluring episodic precinct, and there only but for purposes of display and exaggeration, the sequel of which not unfrequently looms in darkness, that is sorely felt unillumined by the visionary watchword that "time is money," which in such cases is cruelly if not fatally reversed, and should be interpreted thus—a protraction of time, a corresponding increase of expenditure, signifying that time is money, but in an adverse sense and inverse ratio. The motto has two sides and senses diametrically opposed to each other, and as diverse of application as a dually constructed proposition can be. In respect of progressive industries, such as the one we are now considering at its incipient stages and progressive advancement, the axiom "time is money" may be employed in its best and truest significance. The effective substitution of time for money in regard to such enterprises is a safe mode of investment; it not only conserves the exchequer, but conduces to results in every way more lucrative and gratifying than the high-priced sensational schemes dubbed by an irony of romance developed mines, when, in truth, the only development to which they have any distinctive entitlement is a natural deformity, an erratic episode, a sense-alluring, and fancy-deceiving phenomena. The objection as to time in the opening of new mines had its birth and still has its being; so far as it exists in old time nations modern mining accords the phantom no recognition. Less time and expense is very frequently required to lay open a young mine from the surface than to put in order many admittedly developed mines conformable to modern ideas of progress and economy. Not unfrequently has the work of thorough systematic development to be begun *de novo*, and an expense both of time and money equal to what would have been sufficient at the outset in opening a new mine reincurred. What, then, becomes of the figment "time is money" under such conditions, according to the popular acceptation of the term. Besides the crude workings which have been perpetrated and dignified with the pseudonym development may have done much more to impoverish than to augment the intrinsic wealth or improve the prospective outlook of the enterprise.

The mines to which I invite special public attention are situate in the Mammoth mining district of this—Nye—county. In all that pertains to their elemental organisation, their geological and mineralogical associations and accompaniments, they are proof against the most fastidious exceptions. The lodes are not myths, but realities; not shadows, but substantial verities—good in their size, strike, dip, and general composition, and in their relative surrounding the fulfilment of desire. They can be worked expeditiously, and in less time and at less expense than it usually takes in ill-organised developed mines—remunerative points of productiveness can be reached and consecutively followed without let or hindrance, such as are incidental to ill-adjusted and ill-adapted arrangements which frequently embarrass and disfigure many advanced concerns. The mines which I recommend as sound and lucrative investments are of the greatest latitude allowed by law in this country—1500 ft. on the course of the lodes and 600 ft. in width; and when it is understood that the locations were made and established from positive knowledge of the lodes they contain, and with the stern purpose of embracing as many of the best as could be contained in such enclosure, their acquisition and value are to be the more appreciated, and where six or seven lodes are known to exist within the defined limits, as is the case in respect of one or more of those I refer to, the economy of their working becomes at once apparent, and the result anticipated proportionally assured. One projected working shaft, connecting with an adit—for which there is ample advantage—would command the entire area, and afford the means of providing the necessary ventilation. Six or seven good-sized silver lodes, well formed and constituted within a ridius of 50 fms. transversely from the working shaft, all in highly congenial strata, fecund of character and facile of progress, to be had on lease without premium, the owners desiring nothing but a share interest in the properties. An ordinary mine lease is of sufficient duration to exhaust such mines to the depth of Dolcoath.

The oldest mine in the Comstock lode has not yet been in work 25 years, but several of them have already been wrought to a depth exceeding that of the deepest mine in Cornwall or England. Mary Ann was worked out to a depth of 300 fms. in about 30 years. A generation of time is long enough to exhaust an ordinary mine whatever its value, whether superlative or otherwise. Robt. Knapp.
Ione City, Nye County, Nevada, Sept. 9.

A VISIT TO THE ANNUAL EXHIBITION OF THE MINING INSTITUTE.

Sir,—On Thursday last I left here for Redruth in one of those conveyances when riding you can without stretching your imagination fancy you hear your bones rattling. However, I arrived there about noon with a whole skin; and after giving Mr. Peter Latora, one of the most hospitable and honest-hearted men in creation a call, I proceeded to Pedn-an-drea stamps, the scene of the pulveriser contest; the only one I found at work was that of Messrs. F. Dingey and Son, of Truro, and is generally pronounced to be the best in the county; some of the others did good work, but it was easily seen at a glance at the stuff in the buddles that Dingey's was par excellence. From the stamps I proceeded to the new Science and Art School, where the result of the labours of the leviathan mechanical geniuses were on exhibit. In front of the school I witnessed a phenomenon, Capt. Josiah Thomas at work (not with his jacket off) at one of Messrs. W. H. Baxter and Co's patent hand-power knapping motion stone breaker and ore crusher; and as long as there was nothing betwixt its jaws, he turned the handle admirably, worthy of a professional barrel organ grinder; but when the jaws contained meat the machine came to a standstill, Capt. Josiah jibbed, and I heard him exclaim that it was too heavy for men to work, which statement is undoubtedly correct. The machine is a neat piece of mechanism, and exceedingly well got up; but, like rock-boring for practicableness, hand labour is out of the question.

When examining the machinery, &c., in the room on the right hand upon entering the School, I found myself in the company of the "big guns" of mining in the county. Before I became aware of their proximity, I felt the influence of magnetism—I should say gas—and upon gazing round for the cause, in the right hand corner of the room, criticising the product of Mr. R. C. Seccombe's brain in endeavouring to catch the gig in case of the rope breaking, there they were, life size, Capts. Teague, Josiah Thomas, Rich, and a few others Mr. Seccombe's invention may answer in downright shafts; but in the majority of the shafts in the county it is not applicable—in fact, it is useless. The different models of safety-catches were apparently taken great interest in by the visitors, especially the "heavy ordinance," the "knowing ones." The most notable feature amongst these models was the entire absence of originality, or a new idea; and it must be allowed that not one of the catches exhibited could be made applicable to general use in the county. I have not the least fear but that the inventive faculty of the county (doubtless pregnant with new inventions) now being brought to bear on this matter may be found equal to the occasion, and soon be productive of good fruit. If not, Cornish ingenuity is played out, and let us no more boast of a thing of the past. The improvements in Mr. R. Stephen's largest size rock-drill, that of the reversible valve, and using a ring for the cylinder end instead of packing, are to be commended.

One very important piece of mechanism was exhibited in relation to mining—Mr. Stephen Humble's patent hook for the prevention of overwinding, which is an acknowledged success, and at all mines where men ride up and down the shaft, the use of this hook, or a contrivance of a similar nature, should be enforced. The success of the telephone with regard to its general use in mines is only a matter of time. The Yankees have already adopted it, which in this instance verifies a favourite saying of theirs—"The Britishers can lick Creation, and we can lick the Britishers." The samples shown of wire roping from three well-known firms were almost perfection; and if the firms in question will manufacture the ropes they sell as near like these samples in quality of wire and make as possible, no one can complain.

The committee and their energetic secretary (Mr. Rich, jun.) are to be congratulated on the successful carrying out of their placarded intentions. The general arrangements throughout the Exhibition were excellent. The amount of good such exhibitions do cannot be estimated, and it is to be hoped for the weal of mining that that of the Mining Institute, held last week, has been financially, as otherwise, an immense success.—*Perranporth, Sept.* 30. W. Niness.

MINERS' TERMS.

Sir,—With your permission I wish to call the attention of the readers of the *Mining Journal* to the unminer-like terms used by those experts who so kindly favour us with reports of the mining districts they have visited. If they wish to instruct the miners and convey a clear description of the rocks, strata, and veins, and their various chemical characters, such as quartz, fluor, carbonate of lime, calcspar, baryta, mundic, or the varieties of pyrities, oxides of iron, felspar, &c., they must make a distinction between these and the rocks and strata. The crystals as above are the matrices, in which the ores are always chemically formed, is as old as the hills, gossan and flookan are more or less in all veins, and are the way or lining on the walls of veins in hard rock, such as granite, grauwacke, whin, clay-slate, green slate of hornblende series, sienites, porphyrys, &c Gossan and flookan are not rocks in any sense of the term. It is truly absurd using the term lode, which is only the ore part of a vein. How many fathoms of veins without a lode many shareholders can tell to their cost. I am sure they will ever remember quartz reefs, rock-bearing strata, porphyry dykes, metamorphic strata, gold-bearing ledges, &c. A specimen of mining knowledge:—"Some mines have given very good ore at surface in limestone, and lodes have become completely sterile on passing schist or porphyry which has by chance been injected between the strata, and proved again productive in re-entering the limestone."

Here is a vein passing through stratified bands, 75 in the section, which is the same all over the earth. This series has five limestones and 70 distinct chemical strata. The one beneath this limestone is a carbonatious shale, 2 or often 4 ft.; the second is a series of grey beds consisting of slate-shales, with lines of pyrites from 6 in. to 2 ft—eight or ten of them in section deep. Third is argillaceous shale—7 or 8 ft.; the fourth a carbonatious shale, 3 ft., sometimes only a few inches. Then comes the limestone as mentioned, 3 yards, varies to some fathoms. The vein carries nothing in the shales or grey beds, but in the limestone, with a matrix of carbonate of lime or fluor, lead, zinc, or copper. He acknowledges the vein strike is north and south, magnetic, and of course the throw or hade 30° south by west. His vein is north and south; dip or underlay or sun check will be east. An east and west vein would throw north by east, magnetic; angle of inclination in hard strata 25°. The hade in shales invariably departs from that, sometimes for many fathoms; vein and strata sink bodily. So the next statement shows they had lost the vein. "An arrangement was made between the owners of the four mines to sink a shaft to ascertain whether any other deposit existed in the lode in depth, and to solve the problem whether metallic deposits are really only caused by infiltration, or also originate from eruption. Up to date the shaft of the Desceada has reached the vertical depth of 600 metres, passing through only a comparatively thin layer of limestone at 200 metres deep, and then entering porphyry"—which of course means a shale. So that the infiltration and eruption are only a crude notion of those who know nothing of

Nature's chemical affinities, or how veins strike through rocks and strata carry lodes where there is sufficient matrices to form ores.

It would be useless entering into all their workings, sinkings, and cross-cuts, &c. They have lost their vein, and this is all from the teaching that we have no stratified bands disconnected with the rocks, but that they are all successional, and so the shareholders lose their money when the vein has only dipped or inclined on the shale strata. I make these remarks because there is a case in point, not to make any unkind reflections on the parties, as they work as they are taught—their geology is at fault. It is expense you look at in these contraries, the difference between working a tunnel in place of an adit level, not knowing the one from the other, a lump for a shaft, a stoping for a level working, a rise for gate, a drift for cross-cut, a drift along a sun cheek for stoping, called a level, cutting out of a sap vein into clean limestone called a cross-cut or drift, when they have left the vein altogether. No one but those who are perfectly acquainted with mining can understand what they mean, and yet you see every day directors and chairmen at mine meetings talking as if they knew all about it. Alas! for mining enteprise.

Oct. 3. —— GEORGE ATTWOOD.

MINING INSTITUTE, AND SAFETY CATCHES.

SIR,—Having declined to accept the bronze medal awarded me for my patent safety catch for skips, I beg you will allow me to make known through the *Mining Journal* my reasons for so doing. In the first place, the plan for which the silver medal was awarded was contained with others in my patent of 1859. This arrangement of catch was abandoned by me after being tested as being impracticable and unsuited to our skip roads, as I found from actual trials that no road was strong enough to bear the pressure put on it when the rope broke; and even if it were the irregularity of the guides in our best constructed roads was so great that no catches on this principle could be depended on. Hence my adapting the catches as shown in my model, the efficiency of which has been proved in several cases of breakage of rope or chain. Yet this important fact was ignored by the judges, who preferred to be guided by theory rather than results obtained in actual work.

I would therefore suggest for the consideration of the Council of the Mining Institute and of the Royal Cornwall Polytechnic Society the propriety of having skips in actual use fitted with catches, and tested when fully loaded, for I maintain that a question of this kind is too important to be lightly dealt with, or to be shelved until another fatal accident occurs. WM. BENNETT.

Roskear Fuse Works, Camborne, Oct. 1.

SAFETY CAGES FOR CORNISH MINES.

SIR,—If such an arrangement for safety cages as your correspondent "R. M." (of Huelva) suggests in last week's Journal is at all practicable, it would seem to offer great advantages over the various appliances for suddenly stopping the cage in case of a breakage. Your correspondent kindly offers to give to those who will communicate with him such details of his idea as will permit of the arrangement being tested. But, seeing the importance of the matter, and that your correspondent has at present no opportunity of himself putting the idea to a practical test, would it be too much to suggest to him that he give the readers of the *Mining Journal* generally in your columns the benefit of such details, when some of our practical mine captains may be able to form an opinion if the idea is at all feasible; and, if so, to carry it out to a practical trial.

Tavistock, Oct. 3. —— T. G. M.

MINERAL DUES, AND MINERS' PROFITS.

SIR,—Dues should be charged in the same manner as income tax is charged—on profits, The law allows a merchant or manufacturer to deduct from his gross receipts all the expenses incurred in the business, such as clerks' salaries, agencies, rates, taxes, hired labour, machinery, &c., and on the balance only the tax is chargeable, if it amount to 150*l.* per annum. Now, in the case of mining, the lords have hitherto charged the dues on the gross receipts, ignoring all the cost of production, which in most cases transcends the amount received for minerals sold. This is manifestly absurd, because, whatever the amount of production, if it does not exceed its costs, the workers have no property for their outlay.

Suppose the lord himself to work a mine, the outlay in which is 10,000*l.*, and against that he receives 10,000*l.* for tin ore, or any other ore sold, he has no benefit from the undertaking; and yet if other people work under the like circumstances the lord charges a royalty of, say, 1-18th on the 10,000*l.*, or about 550*l.* I saw in a newspaper a few days ago a statement regarding some mines in the Camborne district, on which there had been calls paid within a short period amounting to 30,000*l.*, and the dues paid on the minerals raised from the same mines amounted to upwards of 7000*l.*! By drawing the attention of the landowners to the miners' hardships it is hoped they will see that relief is indispensable, and that dues should not be charged unless profit be made out of the works. R. SYMONS.

Truro, Sept. 28. ——

LEAD—ITS CONSUMPTION.

SIR,—Seeing that the present supplies of lead from abroad are, and have been for the past several years, far over and above present consumption, as stated in your valuable Journal of last week, why should not English mineowners and workers petition Government (though a Liberal Government) to revise the present low tariff imposed on foreign lead imported into this country, and so help to protect mineowners' interests at home? Why support foreigners in preference to home interests? Check the currency of supply, then home mines, most of which are now struggling for existence, would come to the fore, and be a matter of encouraging remuneration to those many who have embarked their money in home mining enterprises—enterprises which many of them with only a slight rise in the price of lead might eventually be saved from impending ruin which at present threatens most lead mining properties in England.

Dorchester, Oct. 3. —— F. H. C.

TREBARTHA LEMARNE.

SIR,—I visited the above mine yesterday. I see there is a great improvement in the Gulley lode; the lode is 3 yards wide, granite and tin. There being no arsenical mundic in it it is very easy to make marketable; the 12 heads of stamps that are erected can be kept working full time from this one lode. The lode which the two adits are driven upon contains a large percentage of arsenical mundic, consequently the tin from this lode cannot be made marketable without a burning-house and arsenic flues, which, of course, means time. Now the Gulley lode from its present appearance will pay the cost of the mine and for putting up other necessary erections. There is at present a cross-cut driving south to intersect it in the deep adit, and from the large influx of water within the last few days, it is reasonable to expect they are very near the lode, and if it is as valuable as it is in the Gulley the committee and manager will quickly see they want more stamps. Why this is called the Gulley lode is that it is in a gulley which was the extent of old Mr. Trebartha's workings west, although it was 300 years since he ceased working; still it is very easy to see where they had been in many places; other places has been soiled over since that time. Although the ancients had means of working other than open cutting they returned a large quantity of tin, as there are records to prove that Mr. Trebartha went there a poor man, and became a rich one, for he had five daughters, and after buying 8000 acres of land he was in a position to give them 5000*l.* each cash, and all the tin raised within a few yards of the surface, for he had no possible means of going under the water level. Another disadvantage he had was to get his stuff to the stamps nearly half a mile—there were no tramroads nor even carts in those days. It had to be drawn by horses in wood boxes, commonly called slides, as there would be two pieces of wood about 4 in. square made fast at the bottom of the box, so that it would slide on these pieces called a shoe.

The present company have got water brought on for every available purpose, and they have erected their poppet heads on Rodd's shaft, and commenced drawing yesterday; all appears to answer remarkably well now, as they have got their water-wheel, with all its appliances for pumping, hauling, and stamping, and all working quite satisfactorily, with a good percentage of tin. I believe at the four-monthly meeting to be held on Monday next there will be a call made of 1s. per share, probably the last that will be required, but I expect when the agents' report is read that if 2s. per share was wanted the shareholders would be unanimous in sanctioning it. Still as it is not required it will hardly be asked for. I have no doubt it will be the most pleasant meeting since the mine started two years ago, as they have a bright future for putting the mine in the Dividend List.—*Callington, Oct.* 3. JNO. BUCKINGHAM.

TREVARREN UNITED MINES.

SIR,—Some months ago the shareholders in Indian Queen Consols, Parka Mine, and Gover Consols were informed that these properties were being taken to and amalgamated with Trevarren United Mines, and that they should receive shares *pro rata* in the latter in exchange for shares held by them in the former. Now, Sir, as a small shareholder in the two former mines, I should like to know if any of my fellow-shareholders have yet received their Trevarren certificate; as, although I have written more than once to the secretary for mine, I am told that they are not yet ready; yet soon after the amalgamation a firm of brokers in the City wrote to me to say that the certificates were ready, and were then being exchanged. I should also like to know how it is that the reports from the mines have suddenly disappeared from the pages of the Journal. ANGLO-WELSHMAN.

TIN MINING IN DEVON.

SIR,—I observed the remarks in the *Mining Journal* a short time since relating to tin mining in the western part of Devon. A fine property further east has been obtained, and a lode opened within a few fathoms from the surface, worth from 33 to 48 lbs. of tin per ton, and the tin is of a very high produce, and requires no "burning to clean it." There are several other lodes and cross-courses, and the sett is extensive, and has the advantages of water-power close at hand. No doubt if a good party of mining gentlemen were to take it over and work it in a spirited manner good returns would be made within a little time. The mine can be worked by an immense deep adit on the course of the lodes, and the tinstuff taken direct to water-stamps. With such good advantages for cheap working it cannot possibly fail giving good results on a very moderate outlay, and I hope to see it taken up and worked in a proper mining-like manner, as employment about the district is much needed; and it is considered it would lead to other properties being sought after, and there cannot be the least doubt about it, as the discovery has caused quite a stir about the district. C. H. M.

Moretonhampstead, Oct. 3.

REPORT FROM CORNWALL.

Oct. 4.—The improvement indicated last week is being fairly maintained, and is likely to lead to still better things, though we confess we can see no adequate cause for the very sanguine expectations that are being indulged in some quarters. These are not days of rushes; and gains to be real and lasting must always be steady. However, that there will be further improvement we have no doubt. The Botallack adventurers will have to reconsider their position, since the attempt to sell the mine as a going concern has failed. Perhaps the improvement that has taken place will enable the fresh capital needed to be obtained in another way, though reconstruction is the best plan.

We have noted of late a few instances of the refusal of awards, because in the estimation of exhibitors at various shows, mechanical and agricultural, they did not come up to the merit of the article shown. It is very doubtful whether, in any case, the step is a wise one; certainly in the majority of cases it cannot be, for it simply emphasises a difference of opinion between the exhibitor, an interested party, and the judges, who should be shown to be other than disinterested or incompetent before their decisions are assailed. Naturally every investor believes in his invention, but when two men ride on horseback one must be behind; and it by no means follows, as some sanguine folk appear to believe, that even a patent has any value in itself; patenting an article is very good evidence that the patentee believes in it, but it goes no further. It seems specially unfortunate that Mr. Bennetts, of Roskear, whose safety-skip arrangements have been tested in practice, and which have given absolute evidence of their value, therefore, should have declined to accept the award of the Mining Institute of a bronze medal, in company with Capts. Hosking and Seccombe, and Messrs. Tregoning and Davey, a silver medal being given to Capt. Bishop.

Mr. Bennetts' apparatus is the pioneer apparatus of the county, and as such deserves every recognition. Still since it was introduced so many changes have taken place that advance was imperative, and some ways in which this advance might be made were pointed out by the judges at the recent Polytechnic meeting. The judges at the Mining Institute had a wider range of choice, and acted accordingly, and as practical men their decision is entitled to weight. However, Mr. Bennetts is quite right in his suggestion that all the inventions that are thought worthy of the test should be subjected to actual working trial. After the awful warning at Wheal Agar, and now again in the North, it is impossible to go on as we have been. It is quite certain that we have in the county, apart from what may be yet imported from outside, several devices that are more or less effectual for the purpose in view. One of these, Mr. Bennetts', has been so proved. But what we want is not only an effective plan but the very best plan, and in the absence of full experience all that can be done must be necessarily of a tentative character—that is, with the exception of those devices which any practical man can see at a glance are unworkable or inapplicable

Probably few remarks made in a presidential address ever appealed less to general sympathy than those by Mr. Henderson at the opening of the Exhibition of the Mining Institute, to which we referred last week. They have already produced, however, some of the good that was anticipated by evoking unusually strong declarations of opinion to the contrary, and by strengthening therefore the influence they were designed to counteract. This applies most forcibly to the general observations, but the defence of Mr. Basset, so chivalrously volunteered, and for which up to a certain point there is so much to be said, had an unhappy commentary supplied at the Carn Brea meeting. It is hard to see how Dolcoath has been treated liberally, but it is not much more easy to see any cause for special thankfulness in regard to Carn Brea.

Whether there is likely to be any bid for popular favour in the direction of Mine Law Reform at the next general election or not—and just at present it does not seem likely—it is perfectly certain that apart from party politics such a platform would be likely to receive considerable support. There is an under current of feeling and of dissatisfaction on this matter which may, ere long, gather to a head, and transfer the discussion of mining affairs from the Institute—that is, in their legislative not their practical aspect—to the political arena. The events of the past few weeks have greatly strengthened this feeling, and it is now receiving expression.

Mr. Henderson, by the way, made a casual allusion to his own excellent exhibit the medium of paying a well merited compliment. Modestly referring to his own newly invented dial as the "Henderson dial," and making no allusion to the valuable principles involved, he complimented in the highest terms Mr. Letcher, of Truro, the manufacturer, on his workmanship. "For perfection of construction and accuracy of detail in his scientific instruments," he considered Mr. Letcher second to none, his perfection and finish being equal to that of the best London firms. High praise this, but not unexpected, seeing that Mr. Letcher has taken so many awards for his exhibits, including the silver medal of the Society of Arts for his blowpipe apparatus, concerning which Col. Ross, whose eminence in pyrology no one can question, recently observed that it placed the maker "far away at the head of pyrological instrument makers in Britain." It is, if we mistake not, yet within living memory that not only did there exist no instrument makers in the county, but no one that was really capable of properly repairing a dial of the simplest type. Since then Cornwall has won a great reputation in this line, and it is very satisfactory to find that this reputation is not merely being maintained but increased.

The following is an official list of mining companies in Devon and Cornwall, which, unless reason be shown to the contrary, will be struck off the Stannaries register at the end of three months:—Battishall Silver-Lead, Blackdown, Blisland China-Clay, Bodilhiel Silver-Lead, Bowden Hill, Manganese Britain United, Bulkamore Iron Ore, Camelford Fire-Brick, &c., Cardinham Silver-Lead, Carleen Vor, Carn Down Tin, Combellack, Cornwall Tin and Copper, Deerpark Lead and Iron, Devon and Cornwall Mining and Fire-Brick, Devon Manganese, East Botallack, East Dartmoor Tin and Copper, East Mulberry Tin, East Peevor Tin and Copper, Florence Silver-Lead, Great Harvest Tin and Copper, Great Luxulyan Hematite, &c., Great Perran Iron Ore, Great South Chiverton Silver-Lead, Great Wheal Rodd Silver-Lead, Harrowbarrow Mining, Hayter Magnetic Iron, Illogan Tin and Copper, Kehelland Consols, Kingston Consols, Kingston United Kingston Valley, Luxulyan Iron Mines, Menheniot Silver-Lead, Mid-Devon Manganese, Mounts Bay Tin and Copper, Neptune Copper, New Carleen Vor and West Metal Mining, New North Tamar Silver-Lead, New St. Blazey Tin, New Tincroft United, North Dartmoor Tin, Old Wheal Rose, Silver-Lead and Spathose Iron, Penzance Hematite, Perran Spathose and Hematite Iron, Perseverance Tin and Copper, Plymouth Brickworks, Iron Ore, Ochre, and Limestone Quarries, Plympton Mining and Arsenical, Prince Royal Mining, Great Onslow Consols, St. Dennis Consolidated, St. Stephen's Manganese, Shepherds, Wheal Rose Lead Mining, South Lelant Tin, South Molton Silver-Lead, South Treburgett Silver-Lead, South Wendron Tin, St. Stephen's Hematite, St. Stephen's Tin and Copper, Temple Iron and China-Clay, Tregardock Silver-Lead, Tregardock United, Upton Hematite, Walkham Valley Tin, West Appletree, West Combination Silver-Lead, West Great Polgooth, West of England Hematite, West of England Nickel and Cobalt, West Polberro Tin and Copper, West Roskear Copper, Wheal Allen Siver-Lead, Wheal Bonny Tin, Wheal Mary Tin, and Wheal Victoria Tin. It will be a relief to legitimate mining when the larger proportion of these do disappear. There is never any good in cumbering a list with failures, and some of these concerns were doomed from the start.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Oct. 4.—Business alike in the iron and coal industries is kept within its usual limits this week by reason of the occurence next week of the Quarterly Meetings. What course prices may take on those occasions is uncertain, the more so in the face of the present unsettled state of the wages questions in both industries. Foreign pig prices are this week rather firmer. Northampton strong forge and mottled pigs are quoted 45s., and grey forge qualities 46s. 3d. Leicestershires are 48s. 6d., and Lincolnshires 50s. Native all-mine pigs are 62s. 6d., and common 40s. Sheets sold well to-day in Birmingham at 8*l.* 5s. for doubles, and 9*l.* 5s. for trebles. Bars were 7*l.* 10s. to 6*l.* 2s. 6d. Coal of all sorts abundant at 8s. to 9s. for furnace qualities.

The Coal Trade Wages Board is at a dead-lock. At a meeting held during the week at Dudley to afford further information to the arbitrator, Mr. Haden-Corser, who is preparing an award for the future settlement of wages, the men's representatives opposed the appointment of public accountants to examine the masters' books. The selling prices of slack and coal from the 12 firms, half selected by the men and half by the masters, should be laid, they urged, before the board by the firms themselves. After much argument, during which the operative section continued unmoved the board was adjourned *sine die*, the masters declaring that no satisfactory wages basis could be formed unless accountants were employed. This opposition was doubtless largely determined by a desire to enter into no arrangement, in view of the Manchester Conference. At meetings held this week in several of the 12 districts represented on the board, the men have, however, asked for the board to be again convened, in order that they might claim an advance of 10 per cent. upon present rates. And the Old Hill men have issued a memorial asking all the South Staffordshire and East Worcestershire colliers to give notice next Saturday for a 10 per cent. rise.

On Wednesday the Mines Drainage Commissioners held their annual meeting in Wolverhampton. Mr. Walter Williams was re-elected President for the ensuing year. The reports on the surface and underground works showed that good progress was being made. The reports were passed, and the Chairman and the triumvirate who now govern the works of the Commission severally thanked for their services.

Ironworkers' wages are again to the fore. At a meeting of the Wages Board in Birmingham, on Friday, before Mr. Alderman Avery, as President, to fix the rate for the ensuing three months, the masters asked for a drop of 6d. per ton on puddlers 'wages. The recent drop in the North of England having brought down wages there to 7s. per ton, the Staffordshire masters urge that they cannot afford to continue to pay 7s. 6d. Mr. Capper, the men's secretary, speaking as the men's mouthpiece, claimed, on the contrary, a 7½ per cent. advance. This claim was supported by the statement that there was good demand for iron at present, and that puddlers were scarce. The men had long been convinced that the wages basis was too low, and there was no reason why, because wages had been reduced in the North, there should also be a drop in the Midlands. The net average ascertained selling price of iron of all classes in the North of England was 6*l.* 2s. 4d., whereas the net average price of bars in the Midlands was 6*l.* 15s. 7d. Further, he contended that if the average price of all classes of Staffordshire iron was ascertained the figures would come out as 8*l.* 2s. 4d. per ton. The President promised that his decision should be made known at an early date.

The award of the President of the Wages Board was made known to-day (Thursday) in Birmingham. It states that no sufficient reason was cited to justify either a reduction or an advance, and decrees that from Oct. 2 to Dec. 31 next puddlers wages shall be 7s. 6d. per ton, and millmen's in proportion. After the end of the year a month's notice may be given to terminate the agreement.

TRADE IN SOUTH WALES.

Oct. 4.—The Steam Coal Trade remains in a very active state, and the market is very firm. The next audit will, it is expected, be in favour of the men. The arrival of a large amount of tonnage points to a very active condition of the market the next few days. Last week Cardiff sent away 132,129 tons foreign and 19,794 coastwise; Newport, 36,300 tons foreign and 16,885 coastwise; Swansea, 14,751 tons foreign and 7073 coastwise. Colliery screened is quoted at from 10s. to 11s. 3d.; double screened from 10s. 6d. to 11s. 9d. There is a better demand for small coal.

The Iron and Steel Trades are in a state of uncertainty at the present moment, owing to the demand on the part of the employers for a reduction of 10 per cent. Some of the works, like Cyfarthfa, have settled the point by the concession of the men, while others, owing to agitation, are still in a dubious condition. It is expected, however, that there will not be a general strike, although partial and temporary strikes may take place. The attitude of the men can best be gleaned from the following observations:—The blast furnacemen at the Dowlais Works are still out, and they express themselves as strongly determined not to accept the 10 per cent. reduction which has been resolved upon by the employers. In consequence of the action which the blast furnacemen have taken the Bessemer men have been rendered idle. On Monday some hundreds of labourers were paid off, and on Tuesday another large batch were discharged. The outlook at present certainly presents a very serious aspect. At Cyfarthfa the reduction has been accepted with good grace, and matters there are proceeding with their usual smoothness.

At Ebbw Vale the puddlers are working, and most of the smiths, carpenters, patternmakers, &c., known as "tradesmen" at the works, resumed work on Tuesday morning. The boilermakers (the Unionists) have not resumed work. In this branch at the works there are not more than 20 men employed by the company, and only eight out of the number belong to "the Union;" most of the others at the works are working for a contractor. Many of the men are thoroughly downcast and dispirited in view of what they consider such a heavy

reduction in their wages. No material alteration in the rates of men earning low wages will be made. Although the furnaces were lighted at the old mills on Monday night, preparatory to starting on Tuesday morning, no ballers put in an appearance, as expected, and everything remains idle. Some parcels of iron have been sent away from Newport as follows:—New York, 1670 tons; Montreal, 1288; Buenos Ayres, 1240; Para, 659; Malmo, 350. Cardiff only sent away one parcel of 68 tons. The arrivals of iron ore have been large. Newport received 12,955 tons from Bilbao, and 2425 from other places; Cardiff, 11,301 tons from Bilbao, and 876 from other places. Prices remain low.

The Tin-Plate Trade, although improving, is kept in a somewhat stagnant state, owing to the duel between the manufacturers and speculators. Stocks being low, both on this side and in the United States, it is felt by the manufacturers that a time must soon come when purchases must be made. They will not sell at present under 16s. 3d. for best brands, while buyers will not pay more than 16s. After the Quarterly Meeting the industrial atmosphere will be clearer, and both merchants and speculators will then be convinced as to which side must give way; the victory will remain in all probability with the manufacturers. At present only a few sales take place, and they are made to complete orders made some time since.

TRADE OF THE TYNE AND WEAR.

Oct. 3.—There is little change in the state of the Coal and Coke Trades here during the past week. On the whole they are firm, and they are evidently slowly improving, as is shown by the fact that the returns of the accountants appointed under the Northumberland coal trade sliding-scale show that the selling price of steam coal produced in that county for the past quarter — June, July, and August—was 5s. 4·87d. per ton, there being an increase of 8·87d. upon the standard average selling price of 4s. 8d. per ton fixed in the agreement of March 9, 1883. The present rate of wages for underground workmen and banksmen will, therefore, be increased by 2½ per cent. calculated upon the present standard wages. It is expected that if freights keep low, as they are at present, there will be a good demand for steam coal for the Mediterranean and other foreign markets this winter. In Durham there is an excellent demand for gas and house coal at present, as well as for bunker and manufacturing coal of all kinds. The returns from the mineral department of the North-Eastern Railway Company this month show that the traffic in coal and coke especially has been the largest on record, the shipment of these products having been exceptionally large on the Tyne and Wear. There is a good demand for the best kinds of coke, but inferior sorts are a slow sale in some cases. Some coke ovens are to be started shortly at the Castle Eden Colliery. Since the present company acquired these works they have been greatly extended on the surface and underground. A large tract of excellent coal has been won, and all the necessary arrangements made to work it on an extended scale. The coke manufacture is a new industry there, and as Castle Eden is only six miles from Hartlepool the situation is most favourable for shipping the house and other coal and the coke manufactured at that port.

Mr. William Mason has just completed the difficult sinking operations which have been going on some time at Garforth Colliery, near Ferryhill. Since May last 2000 gallons of water per minute have been pumped, and the Isabella and Sisters shafts are expected to be cleared in the course of a few weeks. The coal and coke exports at Tyne Dock have been enormous during the past week, the quantity shipped being 103,305 tons, or about 1000 tons in excess of the shipments in the corresponding work of last year. The shipment of fire-bricks and other fire-clay goods, and of cement, &c., have also been large.

The Iron Trade has been very steady this week, and prices have been fairly maintained. The shipments for September have been in excess of those for any month this year, having reached 94,367 tons. There is a great demand for No. 3, and the requirements of this particular iron can hardly be met; holders of this naturally insist upon higher rates. The wages question will have to be settled in some way at the end of the year, the sliding-scale having been repudiated altogether. The exploded policy of restricting the output will also terminate with December, the idea of raising prices and wages thereby having proved illusory. The manufactured iron trade is steady and active, but there is little change in prices. Ship-plates are on an average about 6*l.*; bars, 5*l.* 15s. Pig-iron is quoted at 39s. to 39s. 6d. for No. 3—that is, by makers. The large shipments of pig-iron will, it is expected, cause a considerable reduction in stocks, and assist in increasing the value of Cleveland iron. The quantity sent coastwise in September to Scotland was 28,521 tons; Wales, 631 tons. In foreign customers Germany heads the list, having taken 23,491 tons; Russia, 8300 tons; France, 8270 tons; Holland, 6186 tons; America, 1500 tons; and other foreign countries smaller quantities. The total quantity of iron dispatched coastwise was 33,686 tons, and foreign 60,681 tons. Iron shipbuilders continue to be well employed, and as a rule engineers, founders, &c., also are well employed. There is no change in the position of the engineers who are on strike at Sunderland; they appear to be determined to resist to the utmost the unlimited employment of apprentices by the masters. The works, however, are not entirely idle, a considerable number of new hands have been brought from London and other localities, and a very large number of apprentices are employed; the masters are, indeed, engaging all the lads that can be got for a term of years. Of late years it has not been the custom to bind boys to this business; but this strike appears to have revived the old practice, and there is no doubt that this system is on the whole much superior to the loose system which has prevailed of late.

The annual meeting of the Armstrong-Mitchell Company was held last week at Elswick, Sir W. G. Armstrong, Chairman of the directors, presiding. The profit resulting from the year's working amounts to 143,828*l.* 19s. 6d. A sum of 29,000*l.* has been deducted for depreciation, and a dividend of 9 per cent. declared. The shipyard and steel-works are considerably advanced, and work will shortly be commenced at the shipyard. The steelworks will not be in full operation until the end of next year. There are also important extensions in hand at the old works, including a very large shop for carriage work. The service of Mr. White has been secured for the shipyard, This gentleman had filled a very important place in the construction department of the Admiralty.

At Middlesborough, on Tuesday, there was a good attendance on 'Change, and a firm and steady feeling prevailed. Makers quoted 39s. to 39s. 3d. for No. 3 prompt delivery. There is a continued heavy delivery of pig-iron for shipment, and a very substantial reduction of stocks is expected when the returns are made up. There is little doing in warrants. The shipment for the week ending on Monday amounted to 20,645 tons pig-iron and 9348 tons of manufactured iron and steel. The quantity of iron in Connal's stores is 69,360 tons—a decrease of 200 tons on the week. The manufactured iron trade has been very quiet as regards fresh demand, as buyers are holding back. Ship-plates for present delivery are made on a considerable scale, and there is a large consumption going forward. The Darlington Steel Company state that the steel trade is much depressed, and hence they are seeking a reduction of wages, the greater part of the works being closed. Steel rails are from 4*l.* 12s. 6d. to 4*l.* 15s. per ton. The prices of manufactured iron are fairly steady. Bars are 5*l.* 15s.; angles, 5*l.* 10s., &c.

The Trade of the Tees.—At a meeting of the Tees Conservancy Commissioners, on Monday, the question of reducing the dues was considered. Mr. Fallous said that no port was increasing in its shipments like Middlesborough. Last month a ship left with 65,000*l.* worth of Glasgow, Manchester, Birmingham, and other goods; and during the year ending June last the declared value of all the goods shipped, exclusive of coal and coke, was 2,500,000*l.*, against 3,200,000*l.* for a large port like the Tyne.

Healeyfield Lead Mine.—In sinking the Whitwell shaft at this mine a fine branch of lead ore, about 6 in. in width, has been cut through, and some splendid samples of ore have been sent from it to the company's office in Newcastle. The principal object of the company has been of late to prove the value of the mine in depth by the sinking of this shaft; and as this ore has been cut at a point 20 fms. below the previous deepest working, it proves that the veins, are becoming more consolidated in depth. The branch just discovered is running towards the main lode at an angle of 45°. The main lode is lying about 7 fms. from the shaft.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Oct. 4.—The Explosives Company have been fined 40*l.* by the Llanfyllin magistrates for exposing dynamite in course of its carriage from Ellesmere Port on the River Mersey to the contractors' works in connection with the tunnel being driven from Llanwddyn to Hernant for the Corporation of Liverpool.

A sad accident occurred in connection with blasting near the turnpike road in the limestone quarries at Portlywaen last week. A horse took fright, and, with the trap, dashed into another conveyance, to the injury of the occupants of both traps.

The slate and slab quarry at Dinas Mawddy is being restarted with vigour, and the men who had been dispersed among other works are flocking back again. The limestone quarries are fairly busy, some of them turning out from 400 to 500 tons a day.

At the slate-splitting competition recently held at Bangor, the prize was won by the splitters of slate blocks from the Glan-yr-Afon Slate Quarry, near the Snowdon Ranger, between Carnarvon and Beddgelert.

Considerable activity is being displayed in connection with the scheme for extending the Bishop's Castle Railway to Montgomery, and so opening up a through route from the English Midlands to Mid-Wales and the coast.

THE COAL TRADE.

Mr. J. R. Scott, the Registrar of the London Coal Market, has published the following statistics of imports and exports of coals into and from the port and district of London, by sea, railway, and canal, during September, 1883 :— Imports.

By Sea.	Ships.	Tons.
Newcastle	162	153,769
Sunderland	87	72,947
Seaham	20	13,195
Hartlepool	38	17,533
Middlesborough	3	446
Scotch	6	2,859
Welsh	23	27,572
Yorkshire	21	4,084
Duff	1	51
Sml coal, cind & culm	13	5,555
Colonial	2	155
Total	381	303,163
Imports—1882	401	310,828

By Railway and Canal.	Tons.	cwt.
Lond. & N.-Western	130,740	1
Great Northern	89,757	0
Great Western	82,978	0
Midland	213,397	0
Great Eastern	77,039	5
South-Western	5,909	2
South-Eastern	2,007	12
Grand Junction Canal	804	10
Total	602,632	10
Imports—1882	584,506	17

Comparative Statement, 1882 *and* 1883.

By Sea.	Ships.	Tons.
Jan. 1 to Sept. 30, 1883	3615	2,833,693
Jan. 1 to Sept. 30, 1882	3710	2,719,058
Increase—1883	—	114,635
Decrease—1883	95	—

By Railway and Canal.	Tons cwts
Jan. 1 to Sept. 30, 1883	5,119,012 5
Jan. 1 to Sept. 30, 1882	4,678,258 11
Increase—1883	440,753 14

Exports.

Railway-borne coal passing "in transitu" through district	Tons	115,510
Sea-borne coal exported to British Possessions, or to foreign parts, or to the coast	65,095	
Ditto sent beyond limits by railway	13,610	
Ditto by canal and inland navigation	967	79,672
Railway-borne coal exported to British Possessions, or to foreign parts, or the coast	34,983	
Ditto by rail beyond district	55	
Ditto, by canal and inland navigation	61	35,099
Sea-borne coal brought into port, & exported in same ships		105
Total quantity of coal conveyed beyond limits of coal duty district during Sept., 1883		230,386
Ditto, during Sept., 1882		212,196

Comparative Statement, 1882 *and* 1883.

Total distribution of coal from Jan. 1 to Sept. 30, 1883	2,094,580
Total distribution of coal from Jan. 1 to Sept. 30, 1882	1,962,245
Increase in the present year	132,335

General Statement, 1882 *and* 1883.

Increase in coals imported by sea during the present year	114,635
Increase in coals imported by railway and canal	440,753
	555,388
Less increase in coals exported	132,335
Total increase in trade within the London district during present year	423,053

THE TIN TRADE.

Messrs. Ebeling and Havelaar (Rotterdam, Oct. 1) write:—Our tin market has been very dull during the greater part of the past month, and only the closing week has witnessed some increase of activity. Prices, after remaining almost stationary during the first three weeks, now show an advance of about ¼ fl. upon the quotations ruling at the end of August. The uncertainty about the future supplies from Straits and Australia has withheld speculators from operating on anything like a free scale, and the demand consequently may be said to have been a purely consumptive one. The increased consumption in America, which is said to have reached 1300 tons per month, has imparted a good deal of strength to the various markets, and fully justifies the late heavy shipments to that part of the globe. The Dutch Trading Company's fifth sale in 1883 took place on Sept. 27, when 22,382 slabs Banca were sold from 57½ to 57¾ fl., average 57½ fl., and 4100 slabs Billiton were sold from 56¼ to 56½ fl., average 56⅜ fl. This year's last sale will be held towards the end of November.—Banca: The turnover has not been large, holders being mostly very indifferent sellers. From 57 fl. the price gradually advanced to 58 fl. Since the sale there are sellers at 57¾ fl.—Billiton: Spot parcels have been in excellent demand at 56 fl., forward deliveries, however, continuing neglected. Increased requirements from the trade made the price advance 1 fl. during last week, part of which has, however, been lost, and there are now sellers at 56¼ fl., December delivery being quoted ½ fl. higher. The next Batavia sale of about 10,000 peculs will be held on Oct. 30. The position of Banca tin in Holland on Sept. 29, according to the Official Returns of the Dutch Trading Company, was:—

		1883.	1882.	1881.
Import in September	Slabs	11,977	13,193	10,679
Total nine months		127,583	125,994	107,437
Deliveries in September		9,810	10,215	12,360
Total nine months		98,494	97,219	116,663
Stock second hand		42,337	43,419	36,803
Unsold Stock		92,216	71,521	49,000
Total stock		134,553	114,940	85,803
Afloat	Peculs	1,630	—	5,200
Statement of Billiton.				
Import in September	Slabs	6,600	7,691	9,600
Total nine months		87,690	98,142	79,650
Deliveries in September		13,891	6,728	11,200
Total nine months		74,459	66,289	88,608
Stock		65,550	59,919	43,356
Afloat	Peculs	11,000	10,000	16,000
Quotation, Sept. 30—Banca		57½ fl.	65 fl.	58½ fl.
Billiton		56¼ fl.	64¼ fl.	58 fl.

These combined returns of Banca and Billiton for 1883, compared with those for 1882, exhibit—A decrease of the import for Sept. of 72 tons; a decrease of the import for the nine months of 277 tons; an increase of the deliveries for Sept. of 211 tons; an increase of the deliveries for the nine months of 295 tons; an increase of the stock second-hand of 142 tons; an increase of the unsold stock of 647 tons; an increase of the total stock of 769 tons; a decline of the quotation of Banca of 12½ fl. per ton.

The Government Returns for the month of July are as follows:—

Export of tin from Holland.

	July.			Seven Months.		
	1883.	1882.	1881.	1883.	1882.	1881.
To Germany Tons	354	246	436	2256	2007	2215
England	10	6	38	73	62	313
Belgium	127	39	160	902	551	1143
France	35	30	23	174	223	361
Hamburg	17	32	63	200	296	412
The United States	33	48	32	161	67	69
Other countries	49	148	122	187	277	428
Total	625	549	874	3973	3483	4941

Messrs. Strauss and Co. (London, Sept. 30) issue the following Statistics of Tin:—

	Aug. 31, 1883.	Sept. 30, 1883.	Sept. 30, 1882.
Straits and Australian, spot Tons	4,350	3,934	5,312
,, ,, landing	32)	618	167
Straits, afloat ,,	570	525	250
Australian afloat	1,400	1,650	1,225
Banca, on warrants	930	1,323	1,357
Billiton, spot	2,276	2,048	1,872
,, afloat	1,062	750	580
Australian tin in Holland	—	—	29
Stocks in America, including quantity afloat	4,590	4,735	3,870
Total	15,498	15,583	14,662
Prices of Straits and Australian	£93 15	£95 5	£107 5
Deliveries during month in London	1,236	1,143	1,269
,, ,, ,, Holland	710	741	510
Total	1,946	1,884	1,779

Shipments during the month from Straits to London 375 tons, from Australia to London 950 tons, from London and Holland to America 125 tons, from Straits to America 900 tons, from Australia to America — tons. Banca in Trading Company's hands and afloat, 2983 tons.

THE COPPER TRADE.

Messrs. Harrington, Horan, and Co. (Liverpool, Sept. 29)—Chili copper charters for first half of this month were advised on Sept. 15 as 2000 tons bars and ingots, of which 300 tons for England and 1200 tons for orders Continent or England. Price of bars was $17·72½, and exchange 36d. A moderate business has been done in Chili copper since our last report at 63*l.* 15s. down to 62*l.* 17s. 6d. per ton for cash, and at 64*l.* down to 63*l.* 7s. 6d. per ton for forward delivery, the market to-day being steady at our quotations. In furnace material the sales comprise—At Liverpool, 123 tons Canadian regulus to arrive at 12s., 170 tons Italian ore also to arrive at 11s. 9d. per unit. Precipitate—150 tons English at 12s. 7½d. to 12s. 9d., 1347 tons Mason's Spanish at 12s. 3d., and 50 tons of low produce at 12s. per unit. Import of Chili copper during the past fortnight 1798 tons fine, against 1154 tons fine same time last year; delivery 843 tons fine, against 1214 tons same time last year. Import of other copper during the past fortnight 2543 tons fine, against 838 tons fine same time last year; delivery 1755 tons fine, against 590 tons same time last year. Arrivals here during the fortnight of West Coast, S.A., produce:—Quillota, from Valparaiso, 115 tons regulus, 256 tons bars; Glenfarg, from Valparaiso, 16 tons bars; Atlantique, from Pisco, 50 tons ores; Cotopaxi, from Valparaiso, &c., 534 tons bars, 95 tons ingots. At Swansea, Ianthe, from Tongoy and Guayacan, 11 tons regulus, 525 tons bars, 85 tons ingots; Tocopilla, from Tocopilla, 246 tons ores, 448 tons regulus. Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—

	Ores.	Regulus.	Bars.	Ingots.	Barilla.
Liverpool	—	570	18,412	536	—
Swansea	246	4,021	6,743	—	—
Total	246	4,591	25,155	536	—

Representing about 27,306 tons fine copper, against 26,651 tons Sept. 14; against 22,560 tons Sept. 29, 1882; 28,948 tons Sept. 30, 1881; 33,584 tons Sept. 30, 1880.

Stock of copper contained in other foreign ore and Spanish precipitate, 4435 tons fine, against 1936 tons Sept. 29, 1882. Stock of Chili bars and ingots in Havre, 1922 tons fine, against 2680 tons Sept. 29, 1882. Stock of Coro Coro Barilla in Havre, — tons, against 45 tons Sept. 29, 1882. Stock of copper other than Chili in Havre, 395 tons fine, against 275 tons Sept. 29, 1882. Stock of Chili copper afloat and chartered for to date, 10,939 tons fine, against 11,248 tons Sept. 29, 1882. Stock of foreign copper in London, chiefly Australian, 4000 tons fine, against 7246 tons Sept. 29, 1882.

— Messrs. James Lewis and Son (Oct. 1) write:—Chili bars remained steady at 63*l.* 15s. per ton, usual 14 days, until Sept. 7, when they suddenly fell to 63*l.* 2s. 6d., sharp cash, but recovered the fall next day, and during the week following a limited number of sales were made at 63*l.* 12s. 6d. to 63*l.* 15s. usual terms, and 64*l.* to 64*l.* 5s. with three months' prompt. On Sept. 17 the Chili charters were advised as 2000 tons fine—all in bars and ingots—and the market gave way 2s. 6d. to 5s. per ton in the absence of demand. On the 26th 62*l.* 17s. 6d. was accepted for sharp cash, and 63*l.* 7s. 6d. for three months' prompt; but as this reduction brought forward buyers, values have since improved 2s. 6d. per ton for immediate, and 5s. for distant delivery. For manufactured copper there have been considerable transactions for India, and both manufacturers and smelters are understood to have booked as many orders as they can complete up to the end of the year. The deliveries of furnace material have, consequently, been large. The charters to date have just been advised as 1200 tons fine. The arrivals from Chili have been 3276 tons, and the deliveries 1068 tons, and from other countries 4755 tons and 4915 tons fine respectively. The arrivals here from the United States during the past month amount to 729 tons fine, of which 641 tons are in argentiferous ore and matte. The stocks of Chili produce are:—Liverpool, 18,412 tons bars, 536 tons ingots, and 570 tons regulus; Swansea, 6743 tons bars, 4021 tons regulus, and 246 tons ore — 25,155 tons bars, 536 tons ingots, 4591 tons regulus, and 246 tons of ore; equal to 27,396 tons fine, against 25,598 tons on Sept. 1. The total visible supply is 50,942 tons fine on Sept. 1; 47,754 tons Oct. 1, 1882, and 56,625 tons Oct. 1, 1881.

— Messrs. Richardson and Co. (Oct. 1) write:—The stocks of copper produce remaining unsold at Swansea this day are:—Chilian ore, 246 tons; regulus, 4021 tons; copper, 6743 tons; New Quebrada ore, 11,287 tons; Spanish—Rio Tinto regulus, 1904 tons; copper, 27 tons; Portuguese ore, 675 tons; Cape—Namaqua ore, 42 tons=Ore, 12,250 tons; regulus, 5925 tons, copper, 6770 tons. Representing about 10,480 tons in fine copper. The private sales consist of the following:—800 tons Cape ore to arrive at 12s. 6d., and 400 tons at 12s. 7½d. per unit; 3400 tons of New Quebrada ore at 11s. 9d., and 1190 tons regulus at 12s. 3d.; 750 tons Cueva de la Mora precipitate at 12s. 6d.; 1634 tons Union ore at 9s. 8d. to 11s. 8d. according to produce; 10 tons Cuba precipitate at 12s. 3d.; 16 tons Carracedo ore at 10s. 3d.; 283 tons Caveira ore at 10s. 3d.; 85 tons Namaqua ore at 12s. 3d., and 200 tons at 12s. 6d. for 16 per cent. Chili charters for first half of September are reported to be 2000 tons bars and ingots—800 tons for England, 1200 tons for orders England or France.

— Messrs. A. Strauss and Company (Oct. 2) write:—The Chili charters during September, 3200 tons; shipments from Australia, 750 tons; total supplies during September, 9338 tons; total deliveries, 9225 tons.

Cornish Pumping-Engines.—The number of pumping-engines reported for August is 14. They have consumed 1611 tons of coal, and lifted 10·9 million tons of water 10 fms. high. The average duty of the whole is, therefore, 45,500,000 lbs. lifted 1 ft. high by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

Carn Brea—76 in. Millions	47·3
Dolcoath—85 in.	53·2
Mellanear—67 in.	51·6
West Tolgus—Richard's 70 in.	49·4
West Wheal Seton—Harvey's 85 in.	60·5
West Wheal Seton—Rule's 70 in.	51·3

Japanese Winding-Engine.—A winding-engine was made entirely by Japanese workmen from the designs of Mr. George S. Brindley, superintendent of the Akatave Engine-Works, Jeddo, Japan, and is illustrated in Engineering. It is intended for the Imperial Japanese Mines, Müke Public Works Department. The cylinder is 20 in. in diameter, and 42-in. stroke, and is steam-jacketted. The bed-plate is of the Corliss type, the flywheel has wooden lagging on its rim, and is fitted with a brake-strap clipping one-half only. The drum, which is on a second motion shaft geared three to one, is provided with a brake wheel, and its strap clips the whole of its circumference; the attendant can thus stop the engine with the brake alone, even against the full power of the steam. The diameter of the winding-drum over the lagging is 6 ft. The following particulars connected with this work may be interesting:—The diameter of colliery pit shaft is 14 ft.; depth of shaft, 230 ft.; time of winding, 55 secs., on an average, not counting time of changing tubs; the weight of wooden tubs, 530 lbs.; weight of coal in each tub, 930 lbs.; weight of cage, 1500 lbs.; weight of chain, 180 lbs.; weight of steel wire-rope, 200 lbs.; total weight of each lift, 3340 lbs.; 200 sets of tubs in shaft; boiler pressure, 40 lbs. per square inch. At present one tub only is raised by the engine owing to a small output, but shortly two tubs will be used with a steel wire-rope 3½ in. in circumference. The work is done in a fairly creditable manner, and the engine is now working very satisfactorily.

Mining in Guanaxuato, Mexico.—Many "denouncements" of new mines in Guanaxuato are being made, stimulated probably by the continued success of the United Mexican Company. On Aug. 10 last a concession was granted by the State of Guanaxuato for 25 years to Messrs. Anastasio, Delgada, and Co. to work the river bed of Guanaxuato. Mr. S. P. Craven is a member of the company, which is composed of Americans here and elsewhere. The estimated waste of gold and silver from the careless working of the haciendas during the last 300 years—for a long time at 20 per cent., and of late years at 10 per cent.—is calculated to amount to $300,000,000.

Fluess Apparatus—Distillation of Coal.—At the meeting of the Mining Institute of Scotland (Mr. James M'Creath, M.E., in the chair), a discussion took place on the application of the Fleuss breathing apparatus and lamp in the case of mining disasters in which differences of opinion were expressed, but it was acknowledged that there were circumstances under which it might be of use. A Paper on the Relative Advantages of the Exhaust and Forcing Fan by Mr. Beith was also further discussed. Mr. George Beilby then described Young and Beilby's process for the treatment of coal. He pointed out that the objects aimed at were to recover the products of distillation, to treat the residual coke for the recovery of its nitrogen as ammonia, and to produce gaseous fuel. The special points of novelty were the incineration method for producing ammonia from the nitrogen of minerals, the combination of processes to attain the three objects, and the apparatus for economically carrying out the processes. He went on to sketch the process of destructive distillation as applied in the use of fuel, the paraffin industry, the illuminating gas industry, and in coke making; the conversion of coal and coke into gaseous fuel by (1) limited oxidation in coal gas producers (2) by oxidation with red-hot steam, and the application of these principles in existing gas producers. He next described the incineration process as applied to recover ammonia from coke containing nitrogen, and tars and bituminous matters containing nitrogen, as well as the processes as applied in two forms of apparatus in coal retorts at Pentland and at Oakbank, and gave the results of working both forms, showing that the three objects mentioned at the outset had been attained. In concluding he showed the appli-

cability of the process to industries in which raw coal is used, illuminating gas-works, chemical works, and to fuel and ammonia making at coal pits.

Meetings of Public Companies.

QUEBRADA RAILWAY, LAND, AND COPPER COMPANY.

The statutory meeting of shareholders was held at the Cannon-street Hotel, on Wednesday; the chair was occupied by Mr. T. W. MEATES, in the unavoidable absence of the Chairman of the company, the Right Hon. T. C. Bruce, M.P.

Mr. N. G. BURCH (the managing director and secretary) read the notice calling the meeting.

The CHAIRMAN said: The object for which this meeting has been convened is to comply with the requirements of the law in regard to the establishment of new companies, the intention of which is apparently to afford the shareholders an opportunity of knowing what has been done as to the placing of the capital and the general arrangements for working the business of the company. I prefer, therefore, reading what I have to say, because it is rather a report than a speech which I have to make. Our Chairman had intended presiding on this occasion as usual; but owing to urgent private affairs he has been prevented giving effect to his intentions, and he thought you would excuse his absence, the object of the meeting being purely of a formal character. You will remember that on June 12, the two old companies held extraordinary general meetings at which special resolutions were passed for the transfer of their respective properties to this company. On the 28th of the same month these resolutions were confirmed, and the board proceeded at once to give effect to them. It is, therefore, barely three months since the amalgamation was legally decided upon; and in this interval the new company has been effectively established, the old companies—the New Quebrada Company and the Bolivar Railway Company—having practically ceased to exist. The equivalent share capital of the new company has been allotted, and is quoted in the Official List of the Stock Exchange, together with the Six per cent. Debenture Stock, which has been created to extinguish or fund the separate bonded debts of the two old companies. In Venezuela, where the company's property is situate, the requisite decrees have been passed, and the only formality remaining to be effected is the registration of the assignment from the old companies, which will take some little time to complete, it being necessary to effect this at Caracas (where the national registry is kept), and also in the States of the Venezuelan Confederation, which are the special *locale* of the property. Although the present company was only registered in England on June 7, 1883, you will remember that the amalgamation of the old companies is to be regarded as having virtually dated from the beginning of the year, and consequently when the accounts for the current year (to Dec. 31 next) are made up, they will show the company's operations from Jan. 1, without any priority of interests other than the Six per cent. Debenture Stock of this company. In order to give effect to these arrangements it was deemed desirable to take over the unsold stocks of the New Quebrada Company at a valuation, and their proceeds will accordingly appear in the present company's balance-sheet when issued. This is all, I think, I need say in regard to the special object for which this meeting has been convened; but as you will naturally be anxious to know something about our progress during the present year, I will, with your permission, state what has been done, and what is our present position. You are aware that the bulk of our capital (about two-thirds) has been laid out on the railway, with its equipment of rolling stock, steamers, &c., and that we are now practically a railway company, possessing a large area of land—about 300,000 acres, a large portion of which is mineralised—notably the mines of Aroa and Titiara, which we are now working. When the terms of the amalgamation were submitted to you, the Chairman mentioned that the local railway traffic other than mineral amounted to about 20,000*l.* a-year. He wished to be within the mark, owing to the low prices of coffee and other matters. During the first six months of this year the gross revenue was 10,057*l.*, as compared with 9947*l.* during the same period in the last year, so that so far there has been no falling off, and we are not without hopes that by improved arrangements, which are in contemplation, this source of revenue will be materially increased, even under present circumstances. The materials exist for a large development of this traffic, and as the Venezuelan Congress is about to pass a law guaranteeing 7 per cent. interest on any new capital employed in new railways in the country it may be found convenient to take advantage of it to make certain extensions, which cannot fail to conduce to this result. As regards the mines, our tonnage output for the first six months shows a reasonable development over the corresponding period of 1882. It being as follows:—Ore to the coast, 15,300 tons, 1883; 12,600 tons, 1882; increase, 2700 tons; regulus, 2150 tons, 1883; 1474 tons, 1882; increase, 676 tons; kernels, 470 tons, 1883; — tons, 1882; increase, 470 tons; ore to the smelting works, 12,100 tons, 1883; 7320 tons, 1882; increase, 4780 tons. The copper contents of the ore has fallen off a little at Aroa, but this may be considered as only a temporary deterioration, the mineral at the bottom of the mine being of the usual quality. In such large excavations an occasional difference of 1 or 2 per cent. is not unusual in the copper contents of the ore. The manifest policy of the company, now that all conflicting interests have been removed, will be to produce the maximum unitage of copper with the corresponding minimum of tonnage, so as to afford the maximum monetary result at a minimum of cost. It is quite possible that by dressing and other improved methods of concentration on the spot the financial result would be of considerable benefit to the company, although perhaps the actual tonnage might be decreased, and this is a subject which is engaging our most anxious consideration. We have not yet met the lode in Holman's level; but this is merely a question of time, and when accomplished will give us the command of a large reserve of ore. I must not forget that I am probably addressing on this occasion many new shareholders who are not acquainted with our workings, and to whom these remarks will be hardly intelligible; but I hope that with our next report we shall be able to issue a plan, which will enable them to realise what we are doing. The output from Titiara for the six months of this year was 1500 tons, as compared with 1200 tons in the corresponding six months of 1882, and the quality of the ore continues good—about 15 per cent. We cannot expect to increase this output very much until we have completed the new deep adit, which we are putting in. Its length is estimated at 120 fms., of which we had driven 67 to the end of July, and we ought to intersect the lode in about six months hence, or next April. The completion of the railway siding between this mine and the main line has been somewhat protracted in consequence of the very broken character of the ground; but it is now practically completed to the foot of the incline, which will lead up to a point on a level with the entrance to the new adit. We have hitherto worked only two mines—Aroa and Titiara—(the latter only to a small extent); but we have reason to believe there are two other mines within our reach. In fact we have exploring parties upon them at the present time, and are not without hopes that we may obtain satisfactory results from either or both of them before long. There are some other points where mineral has been discovered, which have been followed up; and altogether there is abundant evidence that the district is mineralised in a very unusual degree. There are large bodies of ore in our workings, which we have not yet been able to treat profitably, because of its low copper contents; but we are on the point of testing our ability to wash out the copper, as is done at Rio Tinto and elsewhere with such large profit; and, if we succeed, I need hardly say that the result cannot fail to be very satisfactory. The smelting-works are well established, as you will judge from the output already mentioned. The quality, however, though not lower than it was, is not so good as could be desired; but when we can obtain ore from Titiara to mix with that we are now smelting from Aroa there is good reason to expect much better results, the ore from Titiara supplying the silica which is deficient in that from Aroa. We have also shipped 476 tons of roasted ore, which has concentrated into kernels, the quality of which is about 12 per cent. Unfortunately, the price of copper here is not satisfactory, and our unsold stocks of ore are large; but the general deliveries of the metal are on a large scale, so that we may reasonably hope for some improvement ere long. For the more prompt dispatch of home business we have appointed Mr. Burch managing director, in addition to his office as secretary, he having held that appointment in the railway company; and I feel sure that all who know him, the zeal, the ability, and the courtesy which he always displays will concur in approving of this arrangement. Mr. Holman is now installed as agent of the company, and the necessary changes of staff consequent upon the amalgamation have been carried out. The current year cannot be expected to show any material difference in expense from the previous, because the necessary changes with a view to economy must take some time to effect; but with the next year we hope to accomplish an appreciable improvement in this direction. Political affairs in the country continue quiet; new railways are being opened, others are being surveyed, and altogether we may consider Venezuela to be in the path of progress. We have to regret that the season has been exceptionally unhealthy, and that our staff at Tucacas has suffered rather severely; but this state of things had passed away at the date of our last advices. This then, gentlemen, is the present state of our affairs, and I hope you will agree with me that it may, on the whole, be considered as satisfactory. I cannot, of course, venture to predict what the future has in store for us; but I think it not rash to believe that with the development of the mines we shall have corresponding results. Since we commenced our workings five years ago every year has been marked by decided progress. The output has steadily increased, the proportion of cost decreased; and I do not see why this should not continue. The railway, too, which is in good order, both as regards the line and rolling stock, should contribute to the general prosperity, and if the expectation of an increased traffic, to which I have already referred, be borne out, we shall, I hope, have no cause whatever for any dissatisfaction. In conclusion, the Chairman said that as this was a statutory general meeting he had no resolution to propose, but he should be happy to answer any questions which any shareholders might wish to put.

Mr. BLUNDELL said that at the meeting a year ago something was said relative to the construction of a railway connecting two of the company's mines, by which the silica could be taken from one to the other, and by that means a great saving be effected, and also a saving effected in dealing with the rough ore. He would ask in what position that railway was, and he presumed that if it were being proceeded with it would come under the law of the 7 per cent. guarantee from the Venezuelan Government. As regarded the appointment of Mr. Burch as managing director he did not like to say anything flattering about that gentleman in his presence, but he would say, and he was sure the shareholders would agree with him, that he considered the company were exceedingly fortunate in having a gentleman of such intelligence, capacity, and ability as Mr. Burch. (Hear, hear.) The affairs of the company could not be in better hands, and whilst Mr. Burch remained in that position the shareholders could always rely on everything being done which was possible to be done for the benefit and prosperity of the company.

A SHAREHOLDER asked if there was any litigation outstanding in connection with this company?——The CHAIRMAN: Nothing except a question of royalties, and that is not a question of litigation but of arrangement.

The CHAIRMAN, in reply to a further question on the same subject, said that Mr. Bird had a claim on these royalties, and the mortgagees were also claimants for the royalties, and the matter had to be settled between them, and no doubt it would be settled before the end of January next. It was only a question of royalties, and the company had merely been made parties to the suit. Until the question was settled between Bird and the vendors he did not know what the royalties would amount to. It was a complicated question.

Mr. MACKAY said he had watched this company carefully, and it must be exceedingly satisfactory to everyone who looked into the matter to see that there was a large amount of ore, and that the more they developed the property the more ore there was left behind. This was very important, and showed they had a mine there which would last for more years than anyone present was likely to live to see. He observed in the accounts that the revenue from produce and passengers was 13,000*l.* less in 1882 than in the previous year, which the Chairman accounted for by the fact that coffee was not sent down on so large a scale; but notwithstanding that shortcoming of 13,000*l.*, the directors gave 6 per cent. to the railway proprietors, which was exceedingly satisfactory. Not only that, but he believed they had been able to alter the track from iron rails to steel rails, of which they would have the benefit. Taking that in conjunction with the development of the mine, it held out very good hope for the future. With regard to the 4½ per cent. dividend which the shareholders lately had on the mining part of the property, whilst it was so far satisfactory he did not think it was so large as a good many of the shareholders expected—(a laugh)—judging from the cards which were periodically sent round showing the output. He remembered the shares of the Rio Tinto Company at 2½, and they had since touched 30. It was important that the utmost publicity should be given to the returns from the mine from time to time. It was a long time to wait—12 months—before getting details, and he thought it would be reasonable if the directors saw their way to half-yearly reports and half-yearly dividends. It tried the patience of the shareholders a good deal to go so long without definite information. Some people would not touch an undertaking of this kind simply because it was a mine; but it should be brought before the public that the direction was in the hands of well-known men in the City of London, whose position, responsibility, and respectability were beyond what the public were accustomed to in mining matters. Looking at the large results which were expected from the mine in the future, he would ask the directors whether it would not be advisable to have the company quoted in the official Stock Exchange List as a mining company rather than a railway?

The CHAIRMAN, in reply to the last question, said that the company was not placed under the category of railways on the Stock Exchange List without due consideration, and it was thought that as the railway was the larger property of the two, and as, moreover, last year the railway dividend was 24,000*l.*, and the mining dividend only 13,000*l.*, it was thought better to quote it under the heading of railways. However, it was a matter open to question, and, no doubt, if it were found desirable, the Stock Exchange Committee might be induced to make the change suggested. But it was done after consideration, and he hoped it would prove to the advantage of the company. As regarded the payment of interim dividends, provisions was made for it in the Articles of Association, but whether the directors would be able to give effect to the suggestion this year he did not know. Hitherto, owing to the peculiar arrangement between the railway and the mine it was impossible, but in future they might be able to make a change in that direction, and the directors would endeavour to do so. They might judge of the difficulty which the directors had when he told them they had 15,000 tons of ore at present unsold. As regarded the reports, they had hitherto been issued half-yearly, and this would continue to be done. The board were quite of opinion that the utmost publicity should be given to all these things, and, as he had said, the monthly reports would be continued. (Referring to another portion of the remarks he said it must be remembered that the company had not long had the advantage of united management; but he hoped and believed that in a short time the shareholders would reap the fruits of that amalgamation. As regarded the new piece of railway to which a shareholder had referred, no doubt it was the siding he had referred to in his remarks from the main line to Titiara, which was intended to bring down the silica. It was virtually completed, all but the incline, and by next April he hoped the company would have completed the adit, and also have made some arrangement for bringing the ore down the incline. He did not suppose that piece of line would come under the law regarding the guarantee, as it was entirely on the company's own property. As regarded the next meeting of shareholders it would probably take place in June.

A cordial vote of thanks was then passed to the Chairman and directors, and the meeting broke up.

CONSOLIDATED MINING COMPANY

The ordinary general meeting of shareholders was held at 8t Michael's Hall, George-yard, Lombard-street, on Wednesday, Mr. H. W. SPRATT in the chair.

Mr. CHARLES CADOGAN (the secretary) read the notice convening the meeting. The report and accounts were taken as read.

The CHAIRMAN said the report which the directors had issued might be considered a very concise statement of the absolute position of the company at the present day. They had purposely refrained from calling the shareholders together at an earlier period, because having initiated a certain programme to have called a meeting simply for the purpose of stating that they had failed would have been of very little use, while the calling of such a meeting would have entailed considerable expense, as there were something like 1300 shareholders in the company. The directors had, therefore, instead of calling the shareholders together, informed them of the difficulties of the company by circular. They had now great pleasure in telling the shareholders that the programme laid down had been so far carried out that they were now really at work. So far as that went it was an exceedingly satisfactory state of things. (Hear, hear.) He was sorry to tell them that some of the gentlemen who at the last meeting promised to support the company with their money had, owing to circumstances over which some of them had no control, failed to do so, and the directors were therefore thrown on their beam ends, and had to issue circulars and worry the other shareholders for money. They would not have been in the position they were in to-day but for the assistance of a gentleman who came forward and showed an immense amount of energy, and eventually raised a considerable sum of money. The subscriptions were made dependent upon a sum of 2000*l.* being raised, and when the directors found that after all his exertions this gentleman could only raise 1500*l.* they felt that such exertions ought not to fail, and they therefore put their shoulders to the wheel and made up the 2000*l.* Mr. Cunningham, the manager in Corsica, had written them a letter in the nature of a report, and this had been inserted *in extenso* in the report of the directors in order that the shareholders might be the better able to judge how far he had succeeded in carrying out their views. Mr. Cunningham, in clause after clause, however, showed that he wanted more money. For instance, he said—"As you have already been informed there is no lack of mineral in the Olmeta Mine, where we have several hundreds of tons lying in the galleries that have only to be wheeled to surface, picked over, and sent down to the works. This, however, requires a certain expenditure which one cannot incur without funds." He really wanted more money for working expenses. Under the authority of the shareholders a certain sum of debentures were allowed to be issued, and of this amount 580*l.* was still unissued; but when they considered that out of 1300 shareholders only about 180 had subscribed to the debentures he did not think there should be any difficulty in getting the balance of the debentures taken up, now that the works were in actual operation, and it was hoped would shortly become very productive. They had already received a promise for 50*l.*, so that the amount was reduced to 530*l.*, and he hoped that their appeal to the shareholders would bring about the desired result. The sum required was certainly a very small one amongst so many. They would have noticed the eight kilns were already at work. They had twenty-four kilns built, and they had power to build eight more under the authority which they had from the French Government. They had met with a certain amount of delay in connection with this authority. They could not do in France what they could in England. It would naturally be thought that, having obtained a concession to work and develope a certain mine they could also smelt the ores raised, but they could not do so. They had to work according to the rule of thumb and the red-tape of the French law. They could not get a concession to smelt, because somebody else had a concession before them for smelting in another part of the island. This fact necessitated certain negociations, and he was very pleased to tell them that the result of those negociations was very satisfactory. They obtained the concession which had been granted, and they also acquired a mine, called the Cardo Mine, on most favourable circumstances. The lease was for 21 years, optional at the discretion of the company with six months' notice, and for the concession and the mine they had to pay a rent of 120*l.* a year. With reference to the Cardo Mine Mr. Cunnifugham said—"At Cardo Mine we shall be able in a month or two to shoot out from the superior stopes a considerable quantity of mineral, say, 60 or 70 tons per month, and when the low level is pushed on under the higher ones and communicated with them I hope we shall be able to get from this mine almost if not quite enough to keep the Cardo works in action." Therefore, he thought that for 120*l.* a year as rental they had made a capital arrangement. At that time they unfortunately lost one of the directors, Mr. Applegarth, who was their great mining authority. Mr. Applegarth went to America, and they were then rather at a loss for a man who could advise them as to how the smelting-works should be carried on, but they were fortunate enough to secure the services of Mr. J. Cameron Swan, the vendor of the Cardo property, and after the conclusion of our arrangements Mr. Swan was induced to become a member of the board. Mr. Swan, who was unfortunately unable to be present at that meeting, expressed his belief that they would succeed in Corsica. Mr. Cameron Swan carried on a large business in Newcastle-on-Tyne, and was specially conversant with the treatment of the ores found in Corsica. The company had benefited by Mr. Swan's advice from time to time, and he thought they had been very fortunate in securing the mine, the concession, and, he might say, Mr. Swan too, on such favourable terms. Since sending his report Mr. Cunningham had telegraphed under date of the 27th ult., stating that the furnaces were at work, that 100 tons monthly would pay working costs, and that he wanted cash to start the remainder of the furnaces to get out the 7000 tons uncovered in the Olmita and Cardo Mines. This amount of ore would keep them going at 300 tons a month for two years without further development. In his letter Mr. Cunningham said—"When the galleries had been debarrassed this mineral we can at once raise from 100 to 250 tons of ore per month from the reserves already opened out, and by pushing on the main gallery some 25 metres we shall be able to get 300 tons per month." Taking, therefore, 7000 tons as the present reserve, and the further workings at 300 tons a month, they had a very fair chance of not being stopped for want of mineral; the question was whether they would have to stop for want of money, but he hoped that that would not be the case, for he trusted that the 530*l.* remaining of the debentures would be taken up. Whether or not that would carry them on without further assistance was doubtful. They were in this dilemma, that though they had authority to issue bonds to the extent of 50,000*l.*, they had limited the issue to 30,000*l.*, believing at the time they would not want more than the 30,000*l.* They were now within 580*l.* of that limit, and it was possible that a further 800*l.* or 1000*l.* would be required. Having made the specific arrangement with the debentureholders that they should have a first charge to the extent of 30,000*l.* they could hardly increase the issue without the knowledge and sanction of the debentureholders. This would require some clever finance operation; but supposing they could steadily raise 300 tons a month they might be able to get from the parties who buy their ores three or four months' credit, and by that means be enabled to carry on operations. At all events, the directors would give their closest and best attention to the question when it arises. As to the South Aurora Mine, the position of affairs there was exactly the same as when the shareholders last met. They had reduced the expenses to the lowest possible sum under the American law. The taxes had been reduced to 80*l.* a year, and he was afraid they would not be reduced further. They would be glad to do something with the property; but, at the present time, they were waiting to see what the Eberhardt Company would do. That company had run their tunnel through, and they had made some discoveries; but they were not of a character which should induce the shareholders to put their hands in their pockets to find the money to carry on the South Aurora tunnel. They could only wait for the result of the Eberhardt Company's development. With regard to the directors, they had always kept the number at four, so as to keep the expenses as low as possible. They had power under the Articles of Association to take 500*l.* a year, but they had never taken more than 400*l.*, and that had been taken in paper only. They were now receiving nothing. It was a question for the shareholders to decide, whether or not they should have another director. If they could get a good mining man he thought it would be desirable such an appointment should be made, as Mr. Swan was really the only mining man on the board. They had asked the gentleman, who had assisted the company so materially, to join the board; but his modesty would not allow him to accept the offer made him. With regard to the accounts, there was very little to which to call attention. Since the balance-sheet had been made up some of the calls in arrear had been paid. The expenses looked rather high; but it should be remembered that they were for two years. In the current year the expenses of the office, secretary, and clerks had been reduced from 420*l.* to 250*l.*, while the other items had been cut down to the lowest possible figure. In conclusion, the Chairman moved the adoption of the report and accounts.

Mr. RICHARD TOWNE seconded the motion, and expressed the hope that the shareholders would help the company by subscribing for the outstanding debentures.

Mr. WILLIAMS pointed out that in former years the balance-sheet had contained two considerable assets which he did not see in the present accounts. He asked what had become of the Gilbert and Chandiere and Tintic properties?——The CHAIRMAN replied that those assets were included in the item of 104,766*l.* for mines, mills, and properties in Nevada.

Mr. WILLIAMS asked what was the distance from the Olmeta Mine to the Cardo Mine?——The SECRETARY said it was about eight miles. At present the ores had to be sent by road, but the railway was now nearly completed, which would be a great assistance to them, as it would run to the Olmeta Mine and the Lama Mine also.

Mr. WILLIAMS asked to whom the loan of 400*l.* was due?——The CHAIRMAN replied that that was an advance made by the directors when the company was in great need of money. In reply to a further question, the Chairman said the directors were extremely anxious that the money they were going to spend on the reduction works should not be on any questionable ground that they bought a piece of freehold land on which to erect the works. This gave them a great deal of trouble, as they had to arrange with about 40 freeholders. The works and the roads leading thereto were now perfectly safe.

A SHAREHOLDER remarked that the Corsican mines had never paid, and he saw no prospect of their paying now.

The CHAIRMAN, in reply, pointed out that there were already 7000 tons of ore in sight, and that from 200 to 300 tons could be obtained monthly by extending the workings. The reason why the other companies had not paid was that they had not had sufficient funds to develope the mines properly. Their manager wrote that when the reduction works were completed they would be able to treat 300 tons a month at an expense of 220*l.*, and that the value of the produce therefrom at present prices would be about 790*l.* From this estimate it would be seen that there would be a profit of 570*l.* a month, without touching the Lama Mine, which in itself was an enormous property.

Major JOSEPH remarked that if they reduced the estimate by 50 per cent. they would still have a very good return.

The SECRETARY, in reply to a question, said that 25 samples of the ore had been analysed in England as well as in Corsica, and the average arrived at was nearly 6 per cent. of copper.

Major JOSEPH, in the course of a long address, expressed his belief that the Corsican properties would turn out well; but he expressed the belief that the expenses could be further reduced. He also asked the directors whether they would return the debentures which they had taken for their fees, so as to allow the shareholders to subscribe for them, and to treat their fees as an open debt?

The CHAIRMAN, in reply, said that if the shareholders would subscribe for the balance of the debentures, and any more capital was required the directors would do what Major Joseph had suggested. (Hear, hear.) He did not believe that the expenses could be reduced any further.

The report and accounts were then unanimously adopted.

Mr. J. Bergtheil, the retiring director, was re-elected, and the auditor having been re-appointed, the meeting closed with the usual compliments.

EDISON AND SWAN ELECTRIC LIGHT COMPANIES.

The necessary extraordinary general meetings for effecting the amalgamation of these companies were held at the Cannon-street Hotel on Tuesday, and by the unanimous adoption of the resolutions interminable and expensive litigation has been avoided and the basis settled of a new company, which has a better prospect of success than any connected with electric illumination at present before the public. The resolution was—"That the agreement dated the 1st day of October, 1883, between the Edison Electric Light Company (Limited), of the first part, the Swan United Electric Light Company (Limited), of the second part, and George Black, on behalf of the Edison and Swan United Electric Light Company (Limited), of the third part, be, and it is hereby approved, adopted, and confirmed, and the directors are hereby empowered to do all such things as may be necessary for carrying the said agreement into effect."

At the Edison Electric Light Company meeting (Mr. William Stewart, in the absence of Sir John Lubbock, in the chair), the resolution was moved from the chair, and the Right Hon. E. P. Bouverie in seconding it, observed that a great impediment to the success of electric lighting would be removed by the fusion of the two companies, as the Swan Company was practically the only dangerous competitor they had to face. The Chairman stated that the company had been doing a very successful ship-lighting business during the past half-year, the turn-over during that period equalling that for the whole of the previous year. Mr. Arnold White, a director of the company, observed it might be interesting to know that the first ship in the world which has been lighted by electricity without any subsidiary form of lighting being employed, is the Guion liner, Oregon, which sails on Saturday next. This vessel is lighted throughout by the Edison system.

At the Swan United Electric Lighting Company meeting (Mr. J. Staats Forbes in the chair) the Chairman reminded the shareholders that at the first meeting of the company they suggested the possibility and the wisdom of bringing together diverse interests in the new and somewhat difficult enterprise in which they were engaged, and there was a very general concurrence of feeling on the part of the shareholders as to the wisdom of such a course. The directors had therefore steadily kept the matter in view. He thought that both companies had acted prudently, before considering an amalgamation, in waiting to see what the tenure would be upon which they would proceed under Acts of Parliament or Provisional Orders—a stage at which, he said, they had now happily arrived. He hoped the wisdom of the principle of fusing two interests like Swan and Edison would be admitted without much discussion. With regard to the terms of the amalgamation now proposed, it was of no use raising the question whether the Edison Company or the Swan Company had paid too much for their patents. It was now proposed to fuse the British business of the two companies, but over and above the British business the Swan Company had paid a considerable price for foreign and colonial patents, and as the Edison Company did not possess a similar asset, the Swan Company had reserved these patents from the arrangement now under consideration. Eliminating from their books the purchase price of their foreign and colonial patents, and the outlay they had incurred in advertising and conducting them so far, they found that they had spent 183,847*l.*, and the Edison Company had spent 100,000*l.* There was also the further difference between the two companies that this company's purchase of the Swan patents was "out-and-out," while in the purchase of the Edison patents there was a deferred interest to Mr. Edison—a percentage of profits. After the 100,000*l.* had been covered by 5 per cent., the Edison Company and Mr. Edison were to participate half and half in the surplus. They came to the conclusion, after considerable discussion, that they had better get this half share of future profits over 5 per cent. attaching to the Edison Company, as distinguished from Mr. Edison himself, out of the way by a payment of 25,000*l.* in shares. Mr. Edison had elected to remain as he was. He was entitled, under his original agreement with the Edison Company, to one B share, bearing deferred interest, for every two Edison's Company's shares. The Swan Company proposed to make over all they possessed, with the exception of their foreign and colonial patents, for 183,847*l.*, and the Edison Company would transfer everything they possessed, including their half share of the contingent profits under their agreement with Mr. Edison, for 125,000*l.* For every 100*l.* of capital as it existed under the fusion, or as it would exist when it was increased from time to time, according to the requirements of the business, Mr. Edison would take one B share—for every 75*l.* issued Mr. Edison would get 25*l.* in the nature of a share not bearing interest until the other capital received 7 per cent. For this Mr. Edison was paid his contingent interest in the Edison Company, and the new United Company would have the benefit for five years of his services, and of anything new which he might discover in that period as regarded the electric light.

With regard to the effect of the amalgamation, it was explained that the sale took effect as from June 30. The United Company would allot to the Edison Company 45,000 A shares (part of the original capital of the United Company), of which 40,000 would be issued as having 2*l.* 10*s.* each paid, the other 5000 shares being issued as fully paid—5*l.* each. That made 125,000*l.* in all. With respect, however, to the 5000*l.* fully paid-up shares the option might be exercised of taking the amount represented in half-shares, with a liability of 2*l.* 10*s.* on each. The idea was to broaden the base of the new company, and to have such reserves of credit as would enable them to raise money in the future. The unpaid capital in both the Edison and the Swan companies would be carried over into the fusion, and that was why the shares were issued as 2*l.* 10*s.* paid. Mr. Edison would receive one fully paid-up B share for every 15 paid up, or credited as paid up, in the United Company, and the B shares would only receive dividend after the payment of a dividend on the A shares of a sum equal in the aggregate to a preferial cumulative dividend of 7 per cent. There would be one vote for every A share and one vote for every two B shares, and in the event of such a catastrophe as a winding-up the A shares would be satisfied before the B shares received anything. The Swan Company would receive 183,847*l.*, part of it in shares with 2*l.* 10*s.* paid, and part in fully-paid shares of 5*l.* Powers were taken to raise shares of a preferential character. Supposing the new company should have a business paying them 7, 8, or 10 per cent., and they required capital

to extend it, they would thus be able to raise new capital of a preferential character, but at a much lower rate of interest. It was also provided that resolutions were to be passed confirming the agreement at meetings of the Swan and the Edison Companies, to be called for Oct. 2 (if at day), and that if they refused to do so before Oct. 31 the bargain was off. All the directors were of opinion that the amalgamation would be wise, and that the terms were reasonable and just to both sides.

PROVINCIAL STOCK AND SHARE MARKETS.

Cornish Mine Share Market.—Mr. S. J. Davey, mine share-dealer, Redruth (Oct. 4), writes:—Our market has been dull and inactive this week, but more has been doing in West Setons. Carn Brea, Cook's Kitchens, Dolcoaths, Killifreths, and Wheal Bassets have declined. To-day but little business is doing. At Tincroft meeting a call of 7s. 6d per share was made. Subjoined are the closing quotations:—Blue Hills, ⅛ to ¼; Carn Brea, 4⅝ to 5; Cook's Kitchen, 20 to 22; Dolcoath, 66 to 67; East Pool, 40 to 41; Killifreth, 1¾ to 1⅞; New Cook's Kitchen, 3 to 3⅛; New Kitty, 1¾ to 2; Penhalls, 5s. to 7s. 6d.; Pedn-an-drea, ¼ to ⅜; South Condurrow, 8 to 8⅛; South Crofty, 6 to 7; South Tolcarne, 4½ to 5; South Frances, 9 to 9¼; Tincroft, 7 to 7⅛; West Basset, 4½ to 5; West Frances, 1¾ to 2; West Kitty, 13⅛ to 14; West Peevor, 2⅛ to 3; West Polbreen, ¾ to 1; West Poldice, ¾ to 1; West Seton, 8⅝ to 9; Wheal Agar, 14 to 14⅛; Wheal Basset, 3⅛ to 4; Wheal Grenville, 6 to 6⅛; Wheal Peevor, 3 to 3⅛; Wheal Kitty, 1 to 1⅛; Wheal Uny, 2⅛ to 3; Wheal Coates, ⅜ to ⅝; North Penstuthal, 9s. to 11s.; West Tolgus, 9 to 11; Trevaunance, 2⅛ to 3; South Penstruthal, 1¾ to 2.

— Messrs. Abbott and Wickett, stock and share brokers, Redruth (Oct. 4), writes:—A moderate amount of business this week in Dolcoath, East Pool, and West Kitty. West Setons have been in demand on reported improvement in the mine. Closing quotations herewith:—Blue Hills, ⅛ to ¼; Camborne Vean, ⅛ to ¼; Carn Brea, 4⅝ to 5; Cook's Kitchen, 20 to 22; Dolcoath, 66⅛ to 67; East Pool, 40⅜ to 40⅝; Killifreth, 1¾ to 1⅞; New Cook's Kitchen, 3 to 4; New Kitty, 1⅞ to 2; Pedn-an-drea, 1 to 1¼; South Condurrow, 8¼ to 8⅝; South Crofty, 6 to 7; South Wheal Frances, 9 to 9¼; Tincroft, 7⅛ to 7⅜; West Basset, 4½ to 5; West Kitty, 13⅝ to 13⅞; West Peevor, 2⅛ to 3; West Frances, 1⅝ to 2; West Tolgus, 10 to 12; West Seton, 9 to 10; Wheal Agar, 14 to 14⅛; Wheal Basset, 3¼ to 4; Wheal Grenville, 6 to 6⅛; Wheal Kitty (St. Agnes), 1 to 1¼; Wheal Peevor, 2¾ to 3; Wheal Uny, 2⅛ to 3.

— Mr. M. W. Bawden, Liskeard (Oct. 4), writes:—The mining market has undergone no material change worthy of special remark, and prices are much the same although the result of the Banca sale was very satisfactory, the continued heavy calls have had a depressive influence on most shares and deters investment in mines. Subjoined are the closing quotations:—Bedford United, 1¼ to 1⅜; Carn Brea, 5 to 5¼; Cook's Kitchen, 20 to 20½; Dolcoath, 65 to 65⅛; Devon Consols, 2⅞ to 3; Devon Great United, ⅛ to ¼; East Caradon, ⅜ to ½; East Pool, 39½ to 40; Gawton United, ⅛ to ¼; Glasgow Caradon, ⅜ to ½; Gunnislake (Clitters), 1¾ to 2; Herodsfoot, ⅛ to ¼; Hingston Down, ⅛ to ¼; Killifreth, 1⅝ to 1⅞; Marke Valley, ¾ to ⅞; New West Caradon, ⅛ to ¼; Old Gunnislake, ⅛ to ⅜; Owen Vean, 1⅛ to 1⅝; Phœnix United, 2 to 2½; Prince of Wales, ¼ to ⅜; South Caradon (Limited), fully paid, 1 to 1⅛; South Condurrow, 8 to 8¼; South Crofty, 7¼ to 7¾; South Devon United, ⅜ to ½; South Frances, 9¼ to 9⅝; Tincroft, 6¾ to 7; West Basset, 4¾ to 5; West Caradon, ⅜ to ½; West Mary Ann, ⅛ to ¼; West Kitty, 13 to 13¼; West Phœnix, ⅛ to ¼; West Crebor, ⅛ to ¼; Wheal Agar, 13 to 13¼; Wheal Crebor, 2¼ to 2⅝; Wheal Grenville, 6 to 6¼; Wheal Hony and Trelawny, 1 to 1⅛; Wheal Kitty, 1 to 1⅛; Wheal Jane, ⅛ to ⅜; Wheal Peevor, 2¾ to 3; Wheal Uny, 3 to 3¼, c. p.; St. Just United, 5½ to 6; Wheal Basset, 4 to 4⅛; West Frances, 1¾ to 2.

— Mr. John Carter, mine sharedealer, Camborne (Oct. 4), writes:—There is very little change to notice in the market this week but rather more business has been transacted in a few of the principal tin mines at quotations as under. At Tincroft meeting to-day a loss of 222*l.* 16*s.* 11*d.* was shown on the four months' workings, and a call of 7s. 6d. per share was made. Subjoined are the closing quotations:—Carn Brea, 4 to 4⅛; Cook's Kitchen, 20 to 21; Dolcoath, 66 to 67; East Pool, 40½ to 41; Killifreth, 25s. to 30s.; Mellanear, 3 to 3⅛; New Cook's Kitchen, 2½ to 3; New Kitty, 1⅞ to 2⅛; Pedn-an-drea, ⅜ to ½; South Condurrow, 8 to 8¼; South Crofty, 5 to 6; South Frances, 9 to 9¼; Tincroft, 7¼ to 7½, c. p.; West Basset, 4½ to 5; West Frances, 1½ to 1¾; West Kitty, 13¾ to 14; West Peevor, 3 to 3½; West Poldice, ¾ to 1; West Seton, 8½ to 9; Wheal Agar, 14 to 14⅛; Wheal Basset, 3½ to 4; Wheal Grenville, 6 to 6½; Wheal Kitty, 1½ to 1⅝; Wheal Peevor, 2½ to 3; Wheal Uny, 2¾ to 3; Penhalls, 5s. to 7s.

Manchester.—Messrs. Joseph R. and W. P. Baines, share-brokers, Queen's Chambers, Market-street (Oct. 4) write:—Though at the commencement of the week under notice the markets bid fair to have a brisk record, the anticipation has not been realised; prominent securities being adversely affected by the untoward events at the reception of the Spanish King in Paris and the inclement weather, helped also by poor returns of railway earnings. Foreign funds, though Spanish and Argentine Public Work exhibit some advance, are, on the whole weaker, foremost being Mexican Three per Cents, which, though above lowest, are 1⅝ down on the week. Egyptian Unified are ½, and Daira Sanieh ¾, Italian ⅛, Turkish Stamped ⅛ to ⅜, and Russian ⅜ lower. The transactions on the several series of miscellaneous shares show a pretty good aggregate; and after banks, coal, iron, &c., and mining, have come in for the greatest proportionate share of the business passing, the latter showing stronger than for some little time past. Mexican rails show a renewed fall compared with last week's prices, but to-day's figures at close are distinctly in advance of the lowest of the week. Standing last Thursday at 83¾⅛c 83⅛, they have been forced down to 75 on reduced traffic return; they have, however, rallied to over 77, at about which price they stand this evening.

Banks are fairly brisk, and prices realised on dealings, as well as balance of alterations in quotations, both indicate strength. The number of transactions (which are spread over most of the local concerns) is fully up to or above the average for some time past. Manchester and Liverpool Districts have been marked higher, but have settled back to figures ruling a week ago. Sellers' demands for Manchester Joint-Stock are reduced ½, but buyers' figure remains unaltered. Only Consolidated are lower, and that only 1/16, whilst National Provincial New are ⅛, Manchester and Salford ¼, Liverpool Commercial ⅛, and Lancashire and Yorkshire ⅛ higher.

Insurance.—Just a little more busines is reported but still very slow.—Higher: British and Foreign Marine ⅜, Royal Liverpool ¼, and British Reinsurance ⅛.—Lower: Ocean Marine ¼, Lancashire ⅛, and Maritime 1/16.

Coal, Iron, &c., and Mining.—Compared with a long time past the week's business is very good, and some shares that have recently been weakening have had a rally, Bolckows and Ebbw Vales most particularly.—Higher: Bolckows Fully-paid ½, ditto 12*l.* paid 1, Ebbw Vale Steel, &c., 1/16 to 3/16, Great Laxey Lead Mine ⅛, and Indian Glenrock Gold, 1/16.—Lower: Nant-y-Glo and Blaina Preference ⅛, Palmer's Shipbuilding, B, ¼ to ⅜, Tees Side Iron and Engine, ¼, ditto Preference 3/16, and Canadian Copper 6d. to 1s.

Cotton Spinning, &c.—Market fairly steady, but devoid of much interest, profit on the trade not being considered sufficient to warrant any great demand for shares.

Telegraphs, where changed, are lower and distinctly. Anglos of all issues, Directs, and Western and Brazils all quoted down, the only rise being ⅛ in Easterns.—Telephones quiet and lower, but changes only slight.

Corporation Stocks, &c., strong, taken as a whole. Leeds trifle lower, whilst Manchester and Bradford show little advance.

Miscellaneous local concerns are not much altered; Rylands and Westheads both easier, and London and Manchester Plate Glass ⅛ better.

Railways.—There was activity in English railways early in the week, but, owing to the break in the weather and the insults to King Alfonso, assisted by poor traffic returns, a tumble in prices occurred, which has continued up to the present, Great Easterns, Lancashire and Yorkshire, and the various Deferred stocks suffering most, and closing flat. In Canadians, holders of Trunk securities are being repaid for their tenacity and patience. The Trunk traffic announced to-day is the biggest of the year, and prices, particularly for Ordinary and Third Preference, have responded, latest prices being only a fraction under best points touched. Americans continue to fluctuate; but, on the whole, values are somewhat under those of last week. Ohio mortgages attract attention, and are well maintained.

Newcastle-on-Tyne.—Mr. S. N. Challoner, stock and share broker, Grey-street (Oct. 4), reports:—Local shares are, as a rule, without much change, but Bolckows are in demand at 20 to 20¼, and 12*l.* paid at 12 to 12¼, being a rise of 10s. on the former and 20s. on the latter. Sir W. G. Armstrong-Mitchells 1¼ up, at 120 to 121 ex div.; Teesside Iron, pref., ¼ lower, at 1¾ to 1⅞; Consett Iron without change, at 23 to 23½; Palmer's, A, 28 to 28¼ ex div.; B, 18¾ ex div.; Earle's Shipbuilding, at 21 to 21⅛; Pelsall Coal, at 10¾; Chillington Iron, 1⅝; Lawes, 5⅞ to 6⅛; Langdales, 3⅝ to 3¾; North-Eastern Bank, 6¼ to 6½; Newcastle Chemicals, 37s. 6d. to 40s.; Darlington Iron, 1 to 1½; Newcastle Gas, 172 to 172½; Newcastle Water, 175 to 176; North Shields Water, 26 to 26½; Hartlepool Gas and Water all higher, A, at 9 to 10; B, 7¾ to 8; C, 7⅝ to 7¾; West Cumberland Iron remain 8 to 8¼; Maryport and Carlisle, 194 to 195.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

Stirling.—Mr. J. Grant Maclean, stockbroker and ironbroker (Oct. 4), writes:—During the past week prices have been dull, owing to the unsettled state of foreign politics. There is, however, a slight increase of activity in business, and seeing the harvest as a whole has turned out better than last year, and the Money Market is easy, there is good reason to look for better markets when the political anxiety subsides.

In shares of coal, iron, and steel companies prices are generally better. Clyde Coals have advanced from 67s. to 69s.; Chillington Iron, 25s. 9d.; Llynvi and Tondu Ordinary, 73s. to 75s.; Omoa and Cleland, 22s. 6d.; Marbellas, however, have declined from 74s. 6d. to about 70s.

In shares of foreign copper and lead companies business is quiet. Tharsis remain at 6*l.* 11s. to 6*l.* 12s. 6d.; Cloncurry have advanced to 30s. prem.; Bratsbergs are at 50s. to 52s. 6d.; Canadian, 9s. to 11s.; Lake Superior, 7s. 6d. to 12s. 6d.; Pierrefitte, 15s. to 17s. 6d.; Sentein, 5s. to 7s. 6d.; Souback, 7s. 6d. to 10s.; and Yorke Peninsula (Preference), 13s.

In shares of home mines business is quiet. Gunnislake (Clitters) firm on confirmation of the discovery at their mine. Bedford United are at 25s. to 30s.; Camborne Vean, 2s. 6d. to 3s. 9d.; Coed-y-Fedw, 20s. to 25s.; East Wheal Rose, 10s. to 11s.; East Killifreth, par; East Blue Hills, 4s. 3d.; East Devon Consols, 5s. to 10s.; East Hony, 2s. 6d.; Gogman, 6s. to 7s.; Grogwinions, 5s. to 10s.; Killifreth, 33s. to 35s.; Kit Hills, 2s.; Llandegias, 2s. 6d.; Old Gunnislake, 4s. to 6s.; Old Shepherds, 14s. to 16s.; Rhosesmors, 40s. to 50s.; South Devon, 11s. to 13s.; South Llanfairs, 17s. 6d.; Tamar, 10s. to 12s.; Trebartha Lemarne, 3s.; Wicklow Copper, 8s. 9d.; Wheal Hony, 5s.; Wheal Jane, 5s. to 10s.; and Wheal Lusky, 9d.

In shares of gold and silver mines there is no particular change to notice. Richmonds firm at 6 to 6¼; Akankoos 4s. to 6s.; Appolonia, 30s.; Brazilian, 2s. to 4s.; Broadway Preference, 2s. 6d. to 3s. 9d.; Callao Bis, 8s. 9d.; Chontales, 6s. 6d.; Chile, 12s. 6d. to 13s. 9d.; Colar, 1s. 6d.; Colombian Hydraulic, 4s. to 6s.; Crooke's, 15s. to 20s.; Cankim Bamoo, 4s. to 6s.; Denvers, 1s. 3d. to 3s. 9d.; Eberhardts, 3s. to 5s.; Gold Coast, 9s. to 11s.; Guinea Coast, 3s. to 5s.; Great Zaruma, 7s. 6d. to 12s. 6d.; Hoover Hill, 4s. to 6s.; Kohinoors, 8s. to 10s.; Isabelle, 8s. to 10s.; Kapangas, 2s. 6d. to 3s. 9d.; Mysore, 1s. to 2s.; Montanos, 30s. to 35s.; New Gold Run, 2s. 6d. to 5s.; Nava de Jadraque, 1s. 3d. to 3s. 9d.; New Callao, 7s. 6d. to 10s.; Orita, 10s. to 12s. 6d.; Potosi, 6s. to 8s.; Rio Grande Do Sul, A, 5s. to 10s.; Silver Peak, 1s. to 3s.; Victoria (Venezuela), 10s. to 11s.; West Callao, 11s. 3d. to 13s. 9d.; and West Frontino, 2s. 6d.

In shares of local and miscellaneous companies prices are steady. Oil companies shares firm, on the improving aspects of the trade. Home Mines Trust lower, at 11s. 3d. to 12s. 6d. ex div.; Lawes' Chemicals, 5⅞ to 6⅛. Nobel's Explosives Six per Cent. Debentures enquired for.

Edinburgh.—Messrs. Thos. Miller and Sons, stock and share brokers, Princes-street (Oct. 3), write:—Scotch railways stocks have been firm since last report. In Canadians there has been a further and important advance. Americans show an improvement. Arizona shares have been changing hands at varying prices. Since Wednesday last week Caledonian has risen from 103⅜ to 104, Great North from 57⅜ to 57⅞, Edinburgh and Glasgow from 40⅝ to 41⅜. Glasgow and South Western have declined from 117⅝ to 117⅛. Highland went down from 96 to 94½, but on the favourable dividend they improved to 95. Grand Trunk has risen from 18⅝ to 20 11/16—the Second Preference from 91¾ to 94, the Third to 48⅝. Great Western from 14⅛ to 14½. Canada North-West Land have gone from 71s. 6d. to 78s. 6d., Hudsons Bay from 24¾ to 25⅛. In mines Arizonas have changed from 48s. to 47s., Clyde Coal from 68s. to 69s., Marbellas from 75s. to 70s. 6d., Omoa from 1 to 1⅛. In oil shares Broxburn are altered from 28⅞ to 29⅝, Clippens from 18⅛ to 19⅛, Lanark from 102s. 6d. to 92s. 6d., Midlothian from 12¾ to 12.

SALES OF COPPER ORES.

COPPER ORES SOLD AT THE CORNWALL TICKETINGS, FOR THE QUARTER ENDED SEPTEMBER 30, 1883.

Mines.	Tons.	Amount.
Mellanear	1738	£5062 12 0
Devon Great Consols	2752	5029 2 6
Gunnislake (Clitters)	853	4223 19 6
South Caradon	852	2855 2 6
Levant	500	2447 6 6
Wheal Crebor	402	1944 3 6
Bedford United	354	1311 11 0
Holmbush	475	1076 5 6
West Tolgus	164	983 11 6
Marke Valley	320	698 0 6
South Devon United	290	773 18 6
West Wheal Seton	153	709 4 6
Glasgow Caradon	155	620 4 0
West Caradon	105	536 17 6
Prince of Wales	171	447 0 6
New Cook's Kitchen	106	435 0 0
Tincroft	93	388 13 0
Violet Seton	150	351 16 0
East Wheal Uny	52	235 0 0
Wheal Jewell	88	223 1 0
East Caradon	45	214 17 6
Botallack	20	187 10 0
Gawton	82	59 9 0
Camborne Vean	40	176 17 6
Phœnix	22	175 9 0
New Trumpet Consols	15	165 0 0
Emily	30	163 10 0
East Pool	68	139 4 0
Wheal Arthur	158	125 16 0
West Poldice	26	104 13 0
New West Caradon	20	77 10 0
Mid-Devon	19	64 2 6
Wheal Comford	17	37 8 6
Moants Bay Consols	3	10 16 0
New Redmoor	5	4 15 0

COMPANIES BY WHOM THE ORES WERE PURCHASED.

	Tons.	Amount.
Vivian and Sons	2,511	£ 8,780 16 6
P. Grenfell and Sons	2,144	7,377 8 0
Nevill, Druce, and Co.	2,125	4,925 15 3
Williams, Foster, and Co.	2,471	8,820 14 6
Mason and Elkington	772	2,404 4 3
Total	10,023	£32,308 18 6

COPPER ORES SOLD AT THE SWANSEA TICKETINGS, FOR THE QUARTER ENDING SEPTEMBER 30, 1883.

Mines.	Tons.	Amount.
BRITISH.		
Cambrian	42	£ 326 17 0
Brada	91	227 10 0
Total	133	£ 554 7 0
COLONIAL.		
Moonta	144	£1893 12 0
FOREIGN.		
Caronne ore	366	1907 15 0
Italian	77	375 7 6
Total	443	£2383 2 6
RECAPITULATION.		
British	133	£ 554 7 0
Colonial	144	1,893 12 0
Foreign	443	2,383 2 6
Sundries	238	524 12 0
Total	958	£ 5,355 13 6

COMPANIES BY WHOM THE ORES WERE PURCHASED.

	Tons.	Amount.
P. Grenfell and Sons	312	£ 566 13 6
Nevill, Druce, and Co.	141	753 1 0
Vivian and Sons	150	952 2 6
Williams, Foster, and Co.	355	3,078 16 6
Total	958	£ 5,355 13 6

Barrow-in-Furness, and its Progress.—"The Comparison of Morecombe Bay, Barrow-in-Furness, North Lancashire, and West Cumberland in 1836 and in the present year" formed the subject of a very interesting paper by Mr. Hyde Clarke, read before the Mechanical Section at the recent meeting of the British Association. The author said that at the former date he was engaged in a scheme for the construction of a railway straight across Morecombe Bay from the Lancashire side to the opposite coast. As there was no immediate prospect of a remunerative traffic it was proposed to raise the funds by the reclamation of a large area of land which was exposed at low tide, and which comprised about 40,000 acres. The idea met with a ready local acceptance, and, as there were no engineering difficulties of a formidable nature, it would have probably been carried out, had not the Lord of the Manor and the Duchy of Lancaster both put in a prospective claim to the land it was designed to recover. As no satisfactory terms could be arranged the direct route was abandoned, and in place of it the present Furness line was made, skirting the bay, and crossing the rivers Kent and Severn on long bridges. Although the works had to deal with the disturbing elements of the river flow, and the rush of a large volume of water from the sea at every tide, yet they had stood remarkably well. Since their construction Barrow has risen from a petty harbour without a name to the condition of a first-rate port; the railway put it in connection with the entire system of internal communication, and its great natural advantages had done the rest, and from having only four furnaces it has risen to be a most important seat of the iron trade. The building of the present railway has done a little in the work of reclamation, but there was a company at work with this object. The method was the simple one of silting up the area, which had the double advantage of securing it from the sea and covering it with rich agricultural mould. Hitherto only the Lancashire shore had been the scene of such operations, but there was a prospect of the central area between the rivers being attacked soon. The speaker next called attention to the rapid growth of the town of Barrow, and said that it rivalled that of many places in America. At present its trade was depressed, but still it had a grand future before it, and the port must eventually take the place of others having less natural facilities.

Wilson's Gas Producer.—At the meeting of the South Staffordshire Institute of Iron and Steel Works Managers (Mr. W. J. Hudson in the chair) Mr. C. H. Treglown (Messrs. Tangyes, Limited) read a paper on "Wilson's Gas Producer," and showed how cheaply and successfully the machine produced gas fuel for heating purposes. In answer to questions put by the Chairman, Mr. Treglown said he was not able at the moment to say the temperature at which the gas left the producer, but at the discussion which was to take place he would ascertain. The Chairman said by a new process of the recovery of ammonia the cost of fuel was brought to nothing, and ironmasters had now an opportunity of reducing their first cost. A hearty vote of thanks was given to Mr. Treglown for his paper. In reply, the reader said the producer was about to be fitted with an automatic ash remover, which will greatly enhance the value of the invention.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

The Victoria Salt Company (Limited).—Capital 8648*l.*, in shares of 2*l.* To acquire and carry on an established business at Wincham, Cheshire, The subscribers (who take one share each) are—G. H. Fletcher, 14, George-street; E. Cooper, 14, George-street; F. Cooper, 14, George-street; C. Barber, 3, Laurence Pountney-hill; W. Milward, Richmond; J. McGowan, 14, George-street; H. Kentfield, 14, George-street.

The Dinas Clydach Colliery Company (Limited).—Capital 20,000*l.*, in shares of 50*l.* To carry on the businesses and trades of ironmasters, colliery proprietors, coke manufacturers, miners, smelters, engineers, steel converters, and iron founders in all branches, and to acquire, develope, and work a certain eminent property known as Forchnest, situated in South Wales. The subscribers (who take one share each) are—T. R. Thompson, Cardiff, shipowner; L. Gueret, Cardiff, shipowner; W. Galloway, Cardiff, M. E.; L. Wood, Cardiff, merchant; E. U. Bregeon, Cardiff, merchant; H. Gueret, Cardiff, shipowner; J. Lee, Cardiff, shipowner.

The Devon Consolidated Manganese Company (Limited).—Capital 40,000*l.*, in shares of 1*l.* To buy, lease, or otherwise acquire manganese, or other ores, whether in mines, pits, or quarries, and also mining properties, rights, and powers, &c., and buildings, plant, machinery, and other properties in Devon and Cornwall and elsewhere, and in particular to adopt and carry into effect an agreement made between Mr. Bawden, of the one part, and J. H. Nicholls as trustee of the other, referring to the Coryton Mine and the Cardwell Mine, both situated in the county of Devon, and to fully develope and work those or any other properties. The price to be paid is 28,000*l.*, 20,000*l.* of which in fully-paid up shares, the remainder in cash. The subscribers (who take one share each) are—G. R. Hearn, Selhurst, accountant; G. J. Nicholls, Porterall-road, clerk; E. J. Hearn, Selhurst, clerk; C. C. Baker, Clapton, clerk; C. Clark, Great St. Helens, merchant; W. Cobden, Barnsbury, clerk: F. A. Pitt, Barnsbury, clerk. Each director has to qualify in 200 shares.

Chapman, Morsons, and Company are re-registered and incorporated under the Limited Liability Companies Acts.

Duchy Peru (Limited).—Capital 50,000*l.* in shares of 1*l.* To acquire by purchase or otherwise under contracts or other assurance, lands, mines, mineral properties, and rights and interests in lands and mineral properties situated in Cornwall, or elsewhere in England, for carrying on all mining operations, dealing in, selling, and disposing of ores and minerals generally. The subscribers (who take one share each) are—R. H. Greene, Hornsey, clerk; S. G. Hinton, Poplar, insurance agent; T. R. Stanbra, 79, Walterton-road, clerk; W. J. Twentyman, Stoke Newington, clerk; A. Clegg, East Dulwich, clerk; E. Harvey, Tottenham, secretary; H. C. M. Hamil, 34, Elgin Crescent, metal broker. The subscribers shall appoint the first directors, the number of the latter must not exceed six or be less than three.

The Czar Silver and Galena Mine (Limited).—Capital 75,000*l.*, in shares of 1*l.* To purchase, work, and fully develope the Czar Mine and Smelting Works, situate in the State of Colorado, United States of America, also any other lands, mines, and mineral properties, rights, and interests in the same in the said State or elsewhere in the Union, and to work, develope, and maintain the mines, minerals, and other properties belonging to the company, and generally to carry on in all branches the business of miners, metallurgists, &c. The subscribers (who take one share each) are—R. H. Greene, West Hornsey, clerk; W. J. Twentyman, 264, Amhurst-road, accountant; T. Williamson, 104, Elmore street, accountant; A. Clegg, East Dulwich, clerk; A. Harvey, Tottenham; clerk; W. J. Thomas, 81, Mildmay Park, clerk; J. Hugliff, Barnsbury, accountant. The first board is made up by the subscribers, the number must not be less than four or more than seven.

The Barton-upon-Humber Engineering and Ironfounding Company (Limited).—Capital 5000*l.*, in shares of 10*l.* To acquire and continue a business established in Lincolnshire. The subscribers are—W. H. Sissons, Barton-on-Humber, 20; H. J. Tomlinson, Barton-on-Humber, 20; W. Blyth, Barton-on-Humber, 20; J. Baggott, Barton-on-Humber, 10; E. Hewson, Barton-on-Humber, 5; F. D. Davey, Barton-on-Humber, 10; C. H. Crowder, Barton-on-Humber, 10; F. Gubb, Barton-on-Humber, 5; J. Morris, Barton-on-Humber, 5; J. Dammatt, Barton-on-Humber, 15; A. Gibson, Barton-on-Humber, 10; W. Cross, Barton-on-Humber, 10.

The Abercorris Slate and Slab Company (Limited).—Capital 30,000*l.*, in shares of 1*l.* To purchase, develope, and work a quarrying property, situated in Merionethshire. The subscribers (who take one share each) are—E. H. Stanley, 14, Cornhill; W. Gunn, Harlesden; J. W. Orchard, 101, Leadenhall-street; G. E. Gibney, 4, Queen-street-place; J. R. R. Keane, 11, Clement's-lane; T. Orchard, 51, Queen Victoria-street; A. F. Gunn, 1, Great Tower-street.

Tresoiso Calamind Mines (Limited).—Capital 25,000*l.*, in shares of 1*l.* To acquire a certain mining property, situated in the Province of Santander, Spain. The consideration for same being 12,000*l.*, one-half in fully paid up shares, the other in cash, for the purpose of carrying on all operations connected with a mining and metallurgical company in their respective branches. The subscribers (who take one share each) are—J. A. Green, 14, Union-court, accountant; W. E. Griffiths, 121, Cheapside, accountant; J. C. Shiels, 2, Campden Hill Gardens, merchant; J. H. S. Clarkson, Croydon, clerk; G. Cronin, 149, Great Tichfield-street; J. Bromfield, Hove, engineer; W. G. Liddaman, 61, Cannon-street, jeweller. Each director has to qualify in 50 shares.

The Sheffield Union Banking Company is re-registered, and becomes incorporated under the Limited Liability Companies Acts.

The Southbourne-on-Sea Winter Company (Limited).—Capital 6000*l.*, in shares of 5*l.* The erection and maintenance of a winter garden, and the business of gardeners, fruiterers, nurserymen, &c. The subscribers (who take one share each) are—J. C. Harvey, Bournemouth; H. Bazalgette, Bournemouth; C. Waters, Bournemouth; R. E. Pinder, Bournemouth; J. Druitt, jun., Bournemouth; A. Mc. G. Brown, Bournemouth; W. B. Stevenson, Bournemouth.

The Warnerising Company (Limited).—Capital 100,000*l.*, in shares of 1*l.* To acquire, use, vend, or deal in certain patents to render fabrics proof against moths, mildew, water, &c. The subscribers are—J. Patton, 6, Fenchurch-street, 100; S. N. Price, Bristol, 100; J. Barlow, Manchester, 100; W. N. Tomlins, Manchester, 10; J. Sinclair, 104, Leadenhall-street, 100; A. C. Rees, Deptford, 100; R. G. Sinclair, 17, Grove-road, 10.

Kimberley Diamond Mine—the Reported Reef Slip.—At the meeting of the Kimberley Mining Board, on Aug. 28, the accountant, Mr. Tucker, said that he had just received a telegram from Mr. Robinson in regard to the exaggerated reports sent to Capetown concerning the recent fall of reef. Statements had been sent down that this fall meant the utter collapse of the Kimberley Mine. This was most serious, and meant a disastrous effect, especially when it was considered that the mining question was before the House. On the proposition of Mr. Bottomley, it was resolved to send a telegram to Capetown contradicting the exaggerated statements in reference to the slip. The following telegram was ordered to be sent to Mr. Robinson:—"Board resolved that you be authorised to state reef slip on Sunday was only a subsidence of reef in the mine that became dislodged in October last, and no serious result can be looked for from it. It is not a new fall of reef." The offer of Mr. Staib, on behalf of the French Company, to take the water out of the mine at 6d. per 100 gallons, was accepted.

SOUTH AFRICAN DIAMOND FIELDS.

The publication of a semi-official report, particularly damaging to the interests of those who seek to sell their rights in the Kimberley Mine to Europeans, and which appears to have satisfied few persons of any class, coupled with the republication in the *Mining Journal* of July 28 by Mr. T. C. Kitto of his letter, which we first published in the Journal of Oct. 22, 1881, appear together to have driven certain persons at Kimberley almost frantic (and has led the Diamond Fields Advertiser to make observations which would be objectionable were they not so amusing); yet Mr. Watson seems to be correct, and nothing is stated in denial of the accuracy of Mr. Kitto's letter of October, 1881. At present diamonds are comparatively worthless, and the Kimberley Mine seems to be in almost unworkable condition; but it is useless for the owners of the claims to hope to retire from the concern by inducing European capitalists to pay a large price for property which cannot be worked to a profit by the present owners, who have all the advantage of experience and an intimate knowledge of the business. The sole remedy is to offer those who choose to come in with the requisite working capital a large proportion of future profits, securing them these profits by first combining the owners' interests, and then issuing 1,500,000*l.* of 20 per cent. first mortgage debentures on the whole mine. These could be made redeemable, with 50 per cent. bonus or permanent at the discretion of present owners; but in the present state of the diamond trade and of the Kimberley Mine no European capitalist in his senses would purchase claims in South African diamond concerns upon the terms usually demanded for the transfer of mining property.

At a recent special meeting of the Kimberley Mining Board, Mr. Bottomley, the Chairman of the Central Company and a gentleman of considerable position in Kimberley, said he thought it was time members of the board and those interested in Kimberley Mine should recognise the hostility which existed against the general interests of the mine, and that that hostility emanated from the French Company, whose object was entirely selfish and averse to the general good and advancement of the Kimberley Mine and the whole province generally. The object of claimholders, shareholders, managers, &c., was to make a great colonial affair of the Kimberley Mine, so that its advantages could be realised and felt here on the spot and throughout the length and breadth of the colony. This kind of language is certainly much better calculated to secure for Kimberley the external aid, which it undoubtedly requires, than the semi-truthful statements of some of Mr. Bottomley's opponents. There is an immense amount of work to be done to restore the Kimberley Mine to a profitable condition, even assuming the price of diamonds to advance satisfactorily—of which advance there is at the moment but little hope. Referring to Mr. Watson's report, Mr. Henry Tucker said the actual cost of the removal of the reef from Kimberley Mine, reckoned at 2s. per load of 16 cubic feet, amounted to 1,315,968*l.* 15s., a difference of 438,656*l.* 5s., or nearly one-fourth less than that estimated by Mr. Watson. This alleged difference arises because Mr. Watson estimates that each load of 16 cubic feet brought out of the mine will only represent the removal of 7·2 cubic feet solid, whilst others state that it will equal nearly 10 cubic feet solid. Taking the lower estimate, however, it would be unsafe to conclude that a smaller expenditure than 1,500,000*l.* would put the mine in good order.

Some very valuable practical details were given by Mr. Moreing at the same meeting. Mr. Moreing, like a thorough man of business as he is, proceeded to verify Mr. Watson's figures or prove their inaccuracy, by actual measurement himself. Mr. Moreing stated that shortly after Mr. Watson left Kimberley he made a calculation of the reef for his own sake in order to see what quantity required still to be removed in order to advise his directors on certain points. These measurements were carried on quite independent of Mr. Watson's, with whom he never spoke on this subject. He found by actual survey that the angle of repose was 32° at the present moment. In making his calculations of how the reef should be removed and the evidence of subsidence, which was visible on a large scale, he came to the conclusion that the mine should continue to be worked as an open mine, as being the most economical way of doing it. They came to the conclusion that it would be necessary to have a margin round the hard rock, on which stones could lodge, and thus be prevented from falling right into the bottom of the mine. He thought that having a margin of (say) 20 ft., and having a solid basis of hard rock, the reef would probably stand at a more vertical angle. Therefore, 32° being, he thought, a perfectly safe angle with the hard rock for a base, he arrived at the following data. He divided the mine into eight sections, or cones, and proceeded by calculating the amount of reef to be removed in each of these sections. Section No. 1, beginning at the west end, he got 2,587,350 loads—he might say that he worked this out taking 9 cubic feet solid to the load. The reason he adopted these figures was because 45 ft. was practically the amount of reef that had been found to exist in a cubic yard, and allowing the trucks for shaking down and not properly filled 3 ft., he thought was a very fair basis, which nobody could dispute; he had left out Mr. Watson's 7-2 altogether. Section No. 2, north-west corner, gave him 2,120,600. Section No. 3, behind the Central Gompany, 1,552,000. Section No. 4, somewhere near the east corner, 1,702,400. Section No. 5, the east end, 1,700,400. Section No. 6, the south side, 848,700. Section No. 7, south-west corner, 1,107,750. Section No. 8, adjoining W. A. Hall, 2,247,112—thus giving a total of 13,867,212 loads.

This, Mr. Moreing explained, is taking an angle of 32°, with a marginal ring round the mine of 20 ft., and he continued:—Now, it was very curious, on turning to the report of Mr. Watson, to find that he had gone about this matter on an altogether different system. He (Mr. Watson) has supposed, as a railway engineer would do, the mine to exist; had taken out the exact cubical contents, and deducted the amount of reef from the mine supposed to exist, leaving the balance still to be removed. No doubt the method adopted by Mr. Watson was more correct than the method adopted by him, and was the system generally adopted by railway engineers. He arrived at 4,679,000 yards as the actual quantity to be removed, but taking three loads of 16 cubic feet of loose reef to the cubic yard, they arrived at 14,370,000 loads, or being a difference of only about 200,000 loads. This difference had arisen in this way. Mr. Watson in making his calculations had taken the actual slope of the mine to the margin of the hard rock—this was not a safe or proper thing to do, as any stones from the top would fall down upon the people working below—Mr. Watson had not allowed for any margin at all. Then, again, he had taken an angle of 30°, which was a little flatter. By this means he would get more stuff than him, in consequence of his ring of 20 ft. This, then, it would be seen, counterbalanced the difference. Now, this was a very clear proof that very great care should be exercised before sending a document of the sort that had been sent to the Government. Because his calculations were made with the greatest care and checked over and over again by his assistants.

It was somewhat remarkable, as Mr. Moreing observed, that the measurments of Mr. Watson and his own should be so nearly equal when allowance was made for the difference of the angles of repose. They (the board) had here got figures compiled on totally different basis, by perfectly independent men, each having no knowledge of what the other was doing, and yet the figures to turn out identically the same. That was the reason why he objected to this telegram being sent to Government, as it would stultify them to say that Mr. Watson's figures were incorrect, without abundant proof; such a proceeding would do them more harm than good. Now it might be seen how reasonable was his request for the figures of the engineer, and the inadvisability of sending such a telegram to Government as the one proposed. He had over and over again given it as his opinion that the reef could fairly and well be removed from the Kimberley Mine at 2s. a load, which at that rate would make the total cost of removing our reef difficulties 1,400,000*l.*, as against Mr. Watson's estimate of 1,700,000*l.*; but this, he held, did not materially affect the question. In conclusion, he wished to say it would be most unwise to send a telegram to Government condemning the figures of Mr. Watson upon insufficient data. With regard to the statements that had been made in reference to the French Company, that they were acting in a manner to cause detriment to the interest of Kimberley Mine, he thought to the contrary, and that they were trying their utmost to protect their interests. The French Company had a large stake in Kimberley Mine, and it was their interest as far as possible to make it pay.

There was an attempt on the part of some members present to disprove the accuracy of the figures of both gentlemen; but, as the attempt was only based upon argument and guesses and not upon actual measurement and calculation, it is the estimate of Mr. Watson and Dr. Moreing—for the two estimates are practically identical—that will have to be taken for determining what amount of capital must be raised, and how to raise it. The Kimberley Mine, in its present condition, is a fair speculation though a large one, and one that, with judgment, may be made to yield profits; but cool and deliberate consideration and calculation is necessary to prevent being enticed into the concern upon terms which cannot but lead to disappointment and loss.

NEW ZEALAND COPPER MINING ENTERPRISE.

For many years past efforts have been made at intervals to discover a payable copper lode near Nelson, and more or less success has appeared to attend the efforts of all who have engaged in the work; but the difficulties which have had to be contended with have been so great that the majority of those who have entered upon the search have become disheartened. It was long ere the effect of the failure of the Dun Mountain Company ceased to discourage those who still possessed faith in the mineral resources of the district, for it was felt that what could not be achieved by a large English company, with ample funds, and men of experience and of science at its head, was almost beyond the reach of those less fortunately situated. Within the Nelson district the search for copper has been almost entirely confined to what is known as the Mineral Belt, a strip of country running from D'Urville's Island in a southerly direction, and supposed to continue to the neighbourhood of the Sounds on the south-west of this island. This belt has a remarkable appearance from some of the hills or mountain tops in the vicinity of the Dun Mountain or of Aniseed Valley. Cut out from the forest-clad hills, the bare brown strip is as conspicuous as the macadamised road between verdant meadows. Traversing the steep mountain side, and descending the ravine may this belt be traced for miles, and the opinion has been more than once expressed by the observer that the purpose of this band with barren surface must be for yielding mineral rather than vegetable treasures. Within this line, which has gradually become known as the Mineral Belt, chrome and copper have been found for a considerable distance, and other valuable minerals have also been met with; but though the prospects have seemed to be of the brightest obstacles have presented themselves. Some couple of years ago a man out goat hunting in the neighbourhood of Aniseed Valley came across an outcrop of copper which appeared of extraordinary richness, and, giving information to some gentlemen, he parted with his secret for a consideration. When a right to the land had been obtained, the lode, at once christened the Champion, attracted much notice on account of the specimens brought down. After some negociations with Australian capitalists had fallen through, and several difficulties had been surmounted, a Nelson company was formed with the sole intention of proving the richness of the lode by sinking and driving, and then of forming a large company to work the mine: but some of the shareholders are now apparently disposed to carry on mining on a small scale. So far, the explorations made by this company have brought to view even richer stone than was met with just at the surface, and the result is that considerable interest attaches to this mining venture.

The hills at the east of Richmond, says the Colonist in describing a visit to the mine, are lofty, and sufficiently steep in places, but a horse track has been cut along the spurs by the Champion Copper Mining Company, in order to enable copper from the mine to be sent down on pack horses. On reaching the summit of this dividing range one is rewarded with a magnificent prospect. The valley below is that of the Roding River, which rises near the Dun Mountain, and flows down Aniseed Valley (which we see almost to our right) into the Wairoa River. Having previously left the main valley, or gorge of the Roding River, we now find ourselves on the bank of a small creek called the Miner, and shortly after leaving the workmen's huts we see in front of us a barren bare country, and at once recognise the mineral belt. Before we had actually got beyond the limits of vegetation we were upon the workings of the company. At a convenient height above the creek we saw on the hill side the main drive of the Champion lode, whilst above this men were engaged in commencing another drive on the same lode; and 15 fathoms to the east of these drives, and 100 ft. above the first, was a third, which we found to be upon another lode, which has been called the Doctor's lode. This lode apparently is of a somewhat similar nature to the deposits on the south shores of Lake Superior, where pieces of native copper weighing 156 tons have been met with, but our local mines have yet to be tested. In addition to the native copper black crystal of copper is met with, as well as cuprite or red oxide, which when pure contains 88·78 per cent. of metal, whilst the black oxide contains 79·85 per cent. In this lode sulphur compounds are also found, and these from an economical point of view are the most valuable. There we saw samples, though not very large, of the yellow sulphide, whilst a steel-grey ore, which we were informed had given 67 per cent. of the metal, had been found running down a depth of 9 ft. below the bottom of the drive, to which point only it had been traced. Adjoining the sulphides was red oxide and malachite, or green carbonate, itself a valuable ore, which should contain about 56 per cent. of copper.

The Champion lode is being opened out with all speed. It is mentioned that the lodes under notice run nearly due north and south, whilst in Cornwall they usually run east and west, and there they occur both in the killas or clay-slate, and in the growan or granite. The wall on the western side of the Champion lode is called by some a slate, and undoubtedly to the west of it there is a great deal of slate; but this wall really appears to be a soft serpentine, whilst the eastern wall is said to be elvanite, a rock which occurs in the neighbourhood of granite. The line of these lodes passes under the saddle of the hill on the side of which they are found, and on this saddle we are informed that the spue of copper may be seen, whilst along the line outcrops have been discovered for a distance of two miles. The Champion drive will have to be in a distance of 250 fms., we are told, before it underlies this saddle; but as the company's ground extends a mile beyond that point in the same line it will be seen that should the lode maintain anything like its present richness a gigantic mine will be opened out, and Nelson then might bid fair to rival South Australia, from whence no less than 16,000,000*l.* worth of copper was exported up to the year 1880, since the discovery of the mineral in that country: 7 cwts. of malleable copper to the fathom is considered payable, but Mr. Gilbert said that he had obtained three times that amount in his workings. It will thus be seen that so far as the mine has been opened the prospects are immensely encouraging; but it must be borne in mind that as yet the drive has only been extended some 86 ft., and until it is extended a considerable distance further, prospects alone can be spoken of.

Of the two drives the Doctor's appear to be the richer, although in the rise from the Champion drive a large quantity of native copper as well as grey ore was met with, but the average width of this lode is stated to be 5 ft., somewhat greater than that of the Doctor's lode. The main lode has been traced down to and across the Miner Creek, and for some 7 chains into the bush, which exists on the opposite side and to the north of the workings, at which point the company's ground terminates in that direction. Arrangements have been made for dressing the mineral and making it marketable, and success is confidently anticipated.

HEAT, AND MAGNETISM OF STEEL.—Some interesting experiments have been made by Prof. POLONI to ascertain to what extent the permanent magnetism of steel is affected by temperature. He finds that the diminution of magnetic intensity, by the increase of temperature in the steel bar has no rigid relation to the increase of electric resistance in the metal itself. Indeed, while the permanent magnetism diminishes with increasing rapidity up to a temperature of about 200° Cent., and then less rapidly up to about 300° Cent., becoming inappreciable at red heat; and it seems that with the increase of temperature the electric conductibility of the metal diminishes uniformly.

THE ENGERT BOILER.

An improved boiler, the design of Mr. A. C. ENGERT, has for some time past been in successful operation at his works at Bromley. It was manufactured by Messrs. Fraser and Fraser, of Bromley-by-Bow, and consists of a cylindrical shell 7 ft. in diameter and 16 ft. 6 in. long, having two flat ends secured to the shell in the usual manner. Inside the shell are arranged two flues, the upper 4 ft. 8 in., the lower 4 ft. 6 in. wide, and each 10 in. high. The two flat sides of these flues are connected and stayed by a number of short 3½-in. tubes, placed 9 in. apart, and the upper flue is widened out to a bellmouth in front to receive the fire-grate. This bellmouth-shaped furnace is strengthened by wrought-iron rings being inserted in each joint about 12 in. apart. Close to the back end of the boiler, but independent from it, is set a feed water heater or tank, 4 ft. 8 in. wide, which forms the top and partly the back of the flue chamber at the back of the boiler. This tank is open to the atmosphere, water runs into it from the supply tank, the chief object of having the open feed tank being to separate from the water all the gases which it has absorbed, and which in a closed heater would enter the boiler, where their presence is certainly not desirable, Mr. Engert's opinion being that the violence of explosions is considerably increased when a mixture of steam and gases has collected in a boiler; moreover, the presence of air increases corrosion of the plates, and if the boiler works in connection with a condensing engine, increases the difficulty of maintaining a good vacuum, which in case of the engine supplied by the boiler under notice is excellent.

Just below the bars the inventor uses by preference a slight steam jet, impinging on the incandescent fuel on the grate, to assist the draught, and also to prevent the formation of clinkers. The effect of the internal curtain is very marked, there being, as a rule, not a trace of smoke issuing from the chimney, and even a moment after firing we have only been able just to discover a slight colour in the gases moving away; in short, the boiler either does not produce or it consumes its own smoke. It is claimed that the two flues take up much less space than the two flues in an ordinary Lancashire boiler; in fact, the gain of space is about one-fifth more for water and steam, besides the fact that the crowns of the flues do not stand so high in the boiler, are therefore less dangerous, and can never collapse. The bottom of these flues will in comparison make as much steam as the top, there being a continuous rapid circulation of the water because no stationary film of steam can exist as a non-conductor, and the heat penetrating is always able to form steam.

Economy has been the great result aimed at by this new construction, and it is said that not only has the diminished consumption of coal and the easier production of steam been considered, but the great trouble arising from the accumulation of gases, acids, and lime has also been borne in mind. To counteract this, a tank is fixed at the back of the boiler in such a position that one part of it catches the flame and heat when on the point of leaving the top flue. This boils the water in the tank and disperses the air and acids from it by a pipe of some length (this tank is supplied with water from a higher tank). But as the water can only be heated up to 212° Fahrenheit, which is insufficent to throw out of solution the carbonate of lime, &c., it is necessary to introduce a small pipe heated with live steam from the boiler into the tank. This hot steam widens into a pipe of larger diameter, and so spreads the greater degree of heat required for the solution into the surrounding water. From this point the purified and highly-heated water is pumped into the boiler, and prevents the sudden contraction which is caused when cold water is used. The sediment which accumulates at the bottom of the tank is blown out several times each day, and the steam which was used to superheat the water in the tank is led to the front of the boiler under the grating, and distributed by several jets between the bars, and through the incandescent fire, to be decomposed into gases and used for the better combustion of the fuel. This considerably reduces the draught otherwise required, as a slow draught is decidedly better to form steam and more effective for the combustion of the gases than a forced draught, and the steam-jets will prevent the clinkering or slagging of the earthly matter in the coals. The Engert boiler, without doubt, possesses novel features which are well worth the attention of users of steam-power.

METALLIC ALUMINIUM, AND ALUMINIUM ALLOYS.

For the production of aluminium alloys, according to the invention of Mr. H. NIEWERTH, of Hanover, silicate of iron is mixed with fluoride of aluminium in proper proportions, and the mixture is submitted to a suitable red or melting heat; the charge is decomposed into volatile silicon fluoride, iron, and aluminium, the two latter bodies forming an alloy. In order to obtain the valuable alloy of aluminium and copper from this iron aluminium alloy, the latter is melted with metallic copper; the copper will then, by reason of greater affinity, unite with the aluminium, while the iron will retain but an insignificant amount of aluminium. On the mass cooling the copper-bronze and iron separate out in such manner that both bodies can be readily isolated. In lieu of the pure aluminium fluoride, cryolite, which occurs in Nature, may be advantageously employed, or aluminium chloride may also be used. In the latter case, silicon chloride and iron aluminium alloy are formed. Or, again, pure silicon and aluminium fluoride, or cryolite or aluminium chloride may be used, when pure aluminium is obtained.

The furnace consists of three parts—A B C are three shaft-furnaces made of fire-resisting material, A and B are made to shut by means of some contrivance, such as a convex cast-iron cover. The furnaces A and B communicate with furnace C by the channels, which can be closed by the sides; blast-pipes are provided for the admission of the blast; there are discharge apertures and short tubes connected with a steam-reservoir which admit steam to the furnaces.

The mode of operation of the furnace can be readily understood. Furnaces A and B are filled with some suitable fuel, such as coke, and by the admission of a blast through blast-pipes are blown very hot. The covers are meanwhile lifted up. The middle furnace C is charged with three charges in proper order. The first charge consists of a mixture of carbonate of soda, carbon, sulphur, and alumina; the second charge is sulphate of alumina; the third charge a flux—preferably a mixture of the chlorides of soda and potash. The furnace C must, of course, be strongly heated at the beginning of the operation; it is best to fill with coke first, and as soon as that is warm to put the charge on to the coke, so that it comes to the bottom with the burning coke. A mixing of the charges with coal is not excluded, but is usually not necessary.

The process then continues thus:—The cover on one furnace A is shut down, the slide between it and C drawn up, the slide between C and B closed, and the blast cut off from furnace A. A suitable quantity of steam is now admitted, which spreads itself over the glowing coke, and penetrates downwards through it in the direction of the arrow, breaking up into its constituent parts, oxygen and hydrogen. The oxygen forms, with the carbon of the coke, carbonic oxide gas, while the hydrogen remains uncombined. The gases thus formed, during their passage through the extremely hot coke, themselves acquire a very high temperature, and at length pass by a channel into furnace C, where the charge lies. The highly heated gases, carbonic oxide and hydrogen, act upon the charge so that the first charge breaks up into a combination of sodium sulphide and aluminium sulphide, from which, then, by means of the second charge (sulphate of alumina) free metallic aluminium is formed. Passing into the melting zone, the aluminium will melt and be drawn off. The flux added will assist the fusion of the aluminium together; it is, however, not absolutely necessary.

When the gases generated in furnace A are too cool furnace B is closed by a cover; its coke is kept hot by the blast. The slide between furnaces C and B and the steam-pipe are opened, and the slide between A and B and the steam-pipe closed. The hot gases are

now generated in furnace B, and act as just described upon the charge in furnace C. The process may also be conducted in such wise that the alumina, carbonate of soda, sulphur, and carbon are previously heated, and the bi-metallic sulphide is brought ready formed to the furnace. Instead of the bi-metallic sulphide pure aluminium sulphide may be employed, or a mixture from which it is generated, or again pure sulphide of soda or analogous compounds producing the same effect.

THE DIAMOND FIELDS AND MINES OF KIMBERLEY, SOUTH AFRICA—No. III.

Washing machines, principally of the rotative kind, of from 6 ft. to 15 ft. in diameter, were (says Mr. Paxman) introduced soon after the washing process was resorted to. Sometimes they were made with step bottoms; at others with divisional plates and steps, forming, as it were, a double mill. In these the material is fed in at some part of the periphery; but this mode of arranging the pan has been found by experiment not to be safe, many diamonds being passed out. The cylinders or screens were made with wrought-iron bars, placed longitudinally, to support No. 10 B W G steel wove wire of 1 in. mesh, but they were soon worn out, and had to be frequently renewed. Other systems of washing have been tried, such as passing the sludge in a very diluted state down channels and over numerous ledges and traps; but they were not found suitable, partly because they were liable to allow small stones to pass away, and also because a much larger quantity of water was required for washing.

The washing machine now considered the best was in part designed by the late Mr. Stonestreet, at Kimberley, in 1879, and was called the timbrella washing machine, from the fact of the feed taking place from a central hopper into a series of radiating channels placed upon a revolving cone, the flow thus passing from the centre towards the periphery. As modified by Mr. Paxman and Mr. Thaine Allen, the wash-mill pan, of circular form, is made of steel ¼ in. thick, and is about 13½ ft. in diameter by 2 ft. in depth. It is in the form of an inverted cone with conical bottom rising towards the centre, where a narrow upright ledge and a central aperture allow the lighter sludge to pass away. The pan itself is a fixture. Within it turns an agitator which keeps the whole mass in motion. The agitator consists of a number of arms, of channel section ⌴, bolted to a central boss, and extending radially nearly to the periphery of the pan. Upon these arms are mounted a number of vertical steel stirrers, set at different distances from the common centre in such manner that at each rotation of the agitator every part of the bottom of the pan is passed over, and the earth or sludge disturbed and displaced. The agitator is attached to a vertical shaft, which turns at the rate of 15 revolutions per minute, and is driven by a pair of bevel wheels from the horizontal shaft, which receives its motion by pulleys and strap from the semi-portable engine. Above the agitator is placed the central hopper, into which passes the sludge from the screen. This hopper is attached to the vertical shaft and turns with it, and from it issue a number of channels, extending radially nearly to the periphery of the pan. The ends of these channels rest on, or are attached to, the circular frame of the agitator, and they thus deliver the sludge to near the periphery of the pan. At the end of the day's work a sliding door, extending nearly across the bottom of the pan on one side from the periphery and central aperture is opened, and two broad scrapers, which are attached to two of the agitator arms, but which are not set radially, but at an angle to the centre, are let down to nearly the bottom of the pan, while the mill is in motion, sweeping the whole contents of the pan into a truck on wheels placed under the opening made in the bottom. The elevator, some 20 to 30 ft. in height, is fitted with steel buckets, and driven by an endless chain from the same shaft as the screen. The jumper preferred consists mainly of a doubly standard frame, which carries adjustable pieces, of segment shape, one for each wire rope, and also a central roller or pulley to guide the hauling rope. These jumpers are placed at any points where, from the nature of the ground, a change in the angle of the standing wire ropes becomes necessary.

The tubs are of steel, and are hung on trunnions, supported upon a frame resting, by two grooved wheels upon each side, upon the wire ropes, the tub thus preserving its vertical position, no matter at what angle the wire ropes are placed. The tubs can be emptied in an automatic manner by means of a hook attached to the front, which catches in a cross-bar placed at the point where the discharge is to take place. In practice, however, it is considered safer to have an attendant to perform the operation of placing the hook. Steel wheels were at one time tried with the tubs for running on the wire ropes; but they were found to seriously injure the wire strands, and wheels of soft cast-iron are now preferred. The four wire ropes, called standing wires, are fixed at some point at the back of the machinery, and are led over a frame, fixed at the top of the mine, to a convenient spot in the mine, where the tubs are loaded. At the upper end, near the machinery, the standing wires, of which the extremities are attached to straining screws are passed round pulleys. These screws penetrate wooden beams attached to posts firmly fixed in the ground. The ends of the wire ropes are passed round the pulleys and fastened by a strong wrought-iron clip. A similar clip is used for holding the ends at the extremities of the standing wires in the mine. The ends are fastened to wooden posts, placed about 24 ft. beyond the spot where the tubs are charged. The posts are fixed at the bottom of pits, sunk to a depth of 15 ft. below the surface, thus enabling the ground to be excavated to a depth of 25 ft. without shifting the posts. It is necessary for the wires to have sufficient inclination to cause the empty tubs to run down by themselves, so soon as the strain upon the hauling-rope which brought it up has been taken off by the reversal of the winding-engine. The standing wires are from 1¼ in. to 1⅝ in. in diameter, and are made of the best crucible steel wire. The life of standing wires is from five to seven years.

The hauling ropes are from 7-16ths in. to ¾ in. in diameter, and vary in size according to the load. These also, are made of the best crucible steel wire. Good ropes will haul about 70,000 loads before wearing out. The hauling ropes run in the central grooved friction wheels of the main standard and of the jumpers, and V-shaped pieces of bar iron of half-round section are provided, which guide the rope back into the grooved wheels whenever it has been lifted out by the passage of a tub over a jumper. When a tub ascending from the mine approaches a jumper, the flanges of the wheels upon which it rolls mount the segment-shaped pieces in such a manner that the whole weight of the tub is taken off the ropes and temporarily supported by the segments. This is to prevent the injury of the ropes by jamming between the wheels and their supports. After the passage of the front pair of wheels beyond the angle in the ropes they gradually settle down again upon the standing wires. In descending, the empty tubs act in the same manner, and the hauling rope, guided by the V-shaped pieces, gradually falls into the central roller.

The method of treating the diamondiferous earth is this:—After the "blue" soil has been blasted and collected into trucks it is emptied into tubs, which latter ascend on the standing wires, traverse one or more jumpers, and are emptied into the depositing box. The remainder of the "blue" is then exposed on the depositing ground and slacked, and is delivered into the upper part of the screen or cylinder, into which also is discharged the return water from the elevator with a portion of fresh water. The admixture of water at this point considerably facilitates operations by thoroughly saturating the soil, and assisting it to pass down the shoots. The pieces which are too large to pass through the meshes of the screen are discharged at the lower end into trucks and carried away. A man is generally stationed at that point, however, to watch for large diamonds. The smaller pieces and the water pass through the screen in the form of sludge, and fall into the shoot, and thence into the central revolving hopper. The sludge flows down the channels, and is discharged at the periphery of the wash-mill pan into the mass, which, by the rotation of the agitator, is kept in constant motion. Two forces now come into play—gravity and centrifugal force. The diamonds, and other pieces of high specific gravity, sink, and are urged towards the periphery of the pan, where they settle in the deepest part, while the remainder of the sludge is gradually forced over the inner ledge, and runs down the channel to the elevator. Here the sludge is lifted and thrown upon an inclined screen. This allows the water to fall through into the return shoot, which conveys it back to the upper part of the cylinder. The water is thus used over and over again, not only on account of its comparative scarcity, but also because thick, dirty water, being of greater specific gravity than clean water, has been found more suitable for the washing process. The more solid portion of the sludge flows over the screen and down the shoot, and is discharged over the side of the bank. It frequently becomes necessary to raise an artificial bank to prevent the sludge running back to the machinery, and, in the absence of cheaper building material, it is formed of bags filled with earth.

The residue left in the pan amounts to about 30 cubic feet, and this quantity is then passed through an apparatus called a "pulsator," in which there are a series of sieves of different meshes. Water is pumped in at the bottom, flowing upwards through the sieves at a suitable velocity to carry off the mud and lighter particles, and leaving diamonds, garnets, agates, and other heavy stones. The specific gravity of the diamond largely exceeds that of any other stone found with it. The residue from the washmill is thus reduced to about half its bulk, from 45 to 60 per cent. being removed, leaving only 40 to 55 per cent. to be taken to the sorting tables. To test the efficiency of the machinery it is the practice to put a few interior diamonds, small, and of peculiar shape, easily recognised by the watchers, promiscuously with the diamoniferous earth. Such diamonds are called test stones, and are invariably found again among the residue of the wash-mill pan. They vary in size from 1 carat to 10 carats, and are occasionally even larger. In conclusion, Mr. Paxman states that in 1881 he paid a visit to Kimberley, and on his arrival, found that this industry far exceeded his expectations. Two hundred and three steam-engines were at work in the Kimberley Mines, varying from 4 up to 30 nominal horse-power. Several thousands of trucks were in use, and many miles of rails had been laid from the mine to the numerous depositing sites. In Mr. Paxman's opinion the diamond mining industry is likely to last for at least a century, and if it will ever cease at all is a moot question. Some geologists hold that the kopjes or mines have been forced up by volcanic action from a large underlying bed far down, and that as the present mines are being worked out they become, as it were, shafts by and through which the lower, and probably the richer, strata can be reached. At all events, Kimberley Mine may be said to be little more than begun, and in the other mines only the surface has been worked off as yet.

South Africa is, at the present moment, the only part of the globe in which many diamonds are found, and the value of the yield in the course of a year seems but an insignificant sum when compared with the income of the world and its ever-increasing population and accumulating wealth. There appears, he thinks, to be but slight probability of diamonds becoming permanently cheaper. The railways in course of construction, which will ultimately bring the diamond fields into direct communication with Cape Colony and with the ports on the east coast, are expected to be completed within about two years. Waterworks have recently been constructed which have proved successful, and which will enable water to be sold in Kimberley at 1s. per 100 gallons. The opening of the railway will be followed by a fall in the cost of the necessaries of life, and of raw materials, which are now very dear. All these anticipated advantages, together with amalgamation, cheaper labour and materials, improved appliances, efficient machinery, careful management, and better supervision, cannot fail to exercise a most beneficial influence upon this industry. There is much room for the judicious employment of engineering talent, as well as for the permanent investment of large capital, both of which will doubtlessly be attracted so soon as the fields can be more easily reached than heretofore. A scheme of amalgamation is being promoted by which all the interests in each mine are to be consolidated. Eventually, it is believed, all the mines will be amalgamated, and by this means the working will be more effectually regulated. Thus it is anticipated that a great and prosperous future lies before this enterprising community of diamond diggers in the Cape Colony.

FOREIGN MINING AND METALLURGY.

The condition of the Belgian coal trade remains very good, notwithstanding the relative weakness of the Belgian iron trade. Even as regards metallurgical industry, it may be admitted, also, that is long as employment is as general as it is at present coalowners wilo not have much to complain of. Household coal has been extremely well maintained upon the Belgian markets, and there is a tolerably well-sustained demand for industrial descriptions. The most neglected qualities just now is coking coal. Coke has also been dull, notwithstanding a considerable reduction in the production. In the week ending Sept. 23 the number of trucks laden with coal and coke which passed over the Belgian State lines was 18,995, as compared with 19,807 in the corresponding week of 1882, showing a decrease of 812 this year. In the German coal trade there is a continuous current of orders, so that employment may be said to be general. Orders for the winter begin to arrive in sufficient numbers to enable colliery proprietors to readily dispose of their production. In the Sarre district the extraction during August was heavy, having amounted to 518,905 tons. This is the largest monthly production hitherto recorded. The deliveries from the Sarre district in August amounted to 519,695 tons. In August, 1882, the corresponding deliveries were 482,377 tons. Deliveries have been made almost exclusively by railway. If coke had been in equal demand the results attained would have been much more brilliant. The exports of coal from Germany in the first seven months of this year were 4,674,127 tons. In this total Austria and Hungary figured for 1,193,791 tons; France for 679,726 tons, and the low countries for 1,453,868 tons.

The Belgian iron trade has presented no material change during the last few days; but, nevertheless, the condition of Belgian metallurgical industry has experienced a real and decided improvement during the last two months, the rates previously current being maintained with more firmness. English pig has remained at 2*l.* 6s. per ton, and Charleroi casting pig at 2*l.* 16s. per ton. In Luxembourg pig has been quoted at 2*l.* 6s. 4d. to 2*l.* 8s. per ton. Hard refining pig has been maintained with firmness at 2*l.* 4s. per ton, ordinary qualities at 2*l.*, and mixed pig at 1*l.* 16s. per ton. The Athus-Halanzy group has maintained a quotation of about 2*l.* per ton. Girders have been offered at 5*l.* 4s. per ton. No. 2 plates have been in better demand at 6*l.* 16s. per ton, No. 3 at 7*l.* 12s., and plates of commerce at 10*l.* per ton. An adjudication for 2533 tons of rails required for the construction of the Amblére Railway has taken place at Liége. The John Cockerill Company took 1033 tons at 5*l.* 7s. 7d. per ton; the Thy-le-Château Company took 1000 tons at 5*l.* 8s., and the Ougrée Company 500 tons at 5*l.* 7s. 9d. per ton. The Monceau-sur-Sambre Blast-furnaces Company will pay on Nov. 2 a dividend of 1*l.* 12s. per share in respect of interest and dividend for 1882-3. It appears that the John Cockerill Company has not definitively obtained, as had been supposed in some quarters, a contract for 9656 tons of steel rails for the Upper Italy Railway; further tenders were to be sent in on Thursday, Oct. 4. Plans were recently invited by the Roumanian Government for a great bridge over the Danube; the plans sent in have been examined by a technical commission, which has decided that none of them can be carried out, and that there are no grounds for awarding the first prize offered. The technical commission has, however, allotted the second prize to the House of Gonin, of Paris, and the third prize goes to an Austrian firm, MM. Schmoll and Gaertner.

Transactions have been carried through more readily in the Nord (France), and the advance in prices recently decided on by forgemasters has been admitted by consumers without much difficulty. Some works are even sufficiently occupied to think of carrying prices to 6*l.* 16s. per ton. Iron has also sold at Paris at 6*l.* 16s. per ton, but it is probable that the merchants will be shortly compelled to make a slight advance. Deliveries of considerable importance have been made in the Longwy basin; in August these deliveries amounted to 32,000 tons. Stocks have been decreasing of late at the rate of 2000 to 3000 tons per month, and they will soon be reduced to their normal level. The great French railway companies are still giving out orders. The Orleans has just ordered 600 axles from the Firminy Steelworks Company. The Southern of France has ordered since June 40,000 to 50,000 tons of steel rails, at an average price of 7*l.* 4s. per ton. These rails have been ordered from the Naval and Railway Metallurgical Company. The Western of France has ordered 15 tender locomotives, with six wheels coupled, at 68*l.* per ton. The John Cockerill Company has received from the Eastern of France an order for 100 axles at 15*l.* per ton. The Eastern of France has also given out orders for 60 tyres of puddled steel at 20*l.* per ton. A recent French official return shows that the French railways possess between them 6893 locomotives, 15,413 passenger carriages, and 182,089 goods trucks. Of this rolling-stock the Northern of France, the Eastern of France, the Western of France, the Orleans, and the Paris, Lyons, and Mediterranean Companies own between them 6035 locomotives, 12,850 passenger carriages, and 156,470 goods trucks. In the German iron trade transactions have been carried through with some difficulty. The demand has declined, especially as regards pig and ordinary rolled iron. Plates have been in some request, especially boiler-plates. The exports of pig from Germany in the first seven months of this year are returned at 136,805 tons. The exports of rails from Germany in the same period amounted to 10,153 tons, and the exports of tubes and pipes to 129,866 tons.

TOLIMA MINING COMPANY.—Advices received by the mail of Sept. 25, of which the following is an abstract:—

Friars July returns	$34,067·1
,, ,, cost	28,019·3
Profit	$ 6,047·6

Equal in sterling to 1007*l.* 19s. 2d.

	Fms.	Ft.	In.
The underground report shows	54	1	3
of ground expended, of which	42	5	4
were productive, leaving of unproductive ground	11	1	9

The superintendent, whilst stating that the present invoice represents 110 tons of export ore of an average yield of 236 ozs. of silver to 1 ton, being lower than the previous month's averages, remarks that "the mineral may be taken as representing fairly the general average class of ore at present being raised from the veins all through the mine." He further explains—"As regards the cost, the export and realisation charges upon 110 tons (viz., $12,022) form a considerable item, whilst Clara's ditch and other works in progress represent some $4000 to $5000 of expenditure of a necessary but temporary character, the outlay in question closing with the final completion of such works."

The underground agent reports as follows:—

ENGINE-SHAFT.—No sinking was done last month, but this is being proceeded with this month as fast as the limited supply of water coming to the pumping-wheel will permit. Notwithstanding that coming from the Clara's stream (by the new acequia) the dryness of the season is such as to cause frequent interruptions to the sinking, the power from all present available sources being often insufficient for combined crushing and pumping, so as to keep the bottom workings in fork. Pitwork and pumping connections in good working order.

THE 80 EAST END, by four men, advanced last month 6 ft.

THE 80 WEST END advanced 5 ft. Neither of these ends present any change calling for special remark. In both the general indications give hope of early improvement.

THE 70 EAST END extended 6·8 ft. In consequence of the extreme hardness of the ground progress made has been slow, while towards the end of the month the end fell off somewhat in value. During the past few days a change for the better has occurred in the character of the end both for progress and value, the vein being to-day fully worth 2½ tons per fathom, of evidently high-grade mineral, showing signs of further improvement as the end advances.

WEST END.—The driving of this is resumed this month. The end is in a remarkably large and powerful lode, but not at present of marketable value.

THE 70 EAST WINZE.—Sunk during the month 10·6 ft.; present depth below brace 40 ft. The vein in sole of winze presents a decidedly improved appearance since last report, and is now worth 25 cwts. per fathom, and is increasing in size as depth is attained.

THE 70 CROSS-CUT NORTH.—This is also resumed this month. No change of importance to note.

THE 70 EAST STOPES.—No. 1 yields 35 cwts. of mineral per fathom; ground spent during month 48 ft. No. 2 stope worth 3½ tons per fathom (average for the whole length of stope); wrought during month 42·5 ft.

THE 60 EAST END extended 22 ft. The main lode is composed of schist, flookan, and strings of quartz. The south lode, which has almost passed out of the line of the drivage, is chiefly composed of flookan and sugar-spar. Neither show mineral of marketable value, though small pockets are occasionally met with. The end will be prosecuted on the main (or north) vein, which is that upon which it is intended to communicate with the drivage with the Esperanza shaft.

A RISE has also been let in the back of the 60 west level. The rise is situated some 30 ft. behind the present forebreast, on a branch of ore worth 10 cwts. per fathom.

THE 60 WEST END.—The stuff having been cleared, the driving is again proceeded with. The end continues to present good spots of mineral, and wears altogether a favourable character for future improvement.

THE 60 (No. 5) STOPE continues without change to note since last report, yielding 4½ tons per fathom; ground spent during the month 36 ft. A few blast-holes put into the footwall and eastern end of the winze, with which this stope connects, show a fine course of mineral going into the eastern end of the winze over the 70 east drivage. At the point where the lode was so tested it appears to have made a splice, or abrupt expansion into the south wall, and is there fully worth 10 tons per fathom. The west stope still yields 40 cwts. per fathom; stoped 30 ft.

THE 50.—Esperanza shaft has been sunk during the month 86·1 ft.; present depth below brace in 50 fm. level 21 ft. Progress has been slow, in consequence of having a rather heavy feed of water to deal with, and the ground being rather spare for spending. No change is presented in the character of the vein.

THE 50 CROSS-CUT SOUTH advanced 6·4 ft.; has just struck what appears to be the north wall of Busto's branch (the south part of the main lode). The character of the branch will be seen in a few feet further driving; at present it would appear to be small, and without value for mineral.

THE 50 WEST END still shows a large and powerful lode, with occasional stones of ore, though not of commercial value. Driven during month, 8·5 ft.

THE 40 FM. LEVEL drift, on south lode, extended 12 ft. Slightly improved during the month; a good pocket of mineral appeared near the roof. This, however, gave out, the end remaining at date of about the same value as last reported—13 cwts. per fathom. This section is well worthy of prosecuting the trial further.

THE 40 WEST END (main lode), driven 13·5 ft., presents the same encouraging appearances indicated in last report, a decided change having taken place in the character of the vein, which is now composed of light grey schists, quartz, and flookan, with considerable quantities of iron pyrites. Water in small quantities issues from the end.

THE 20 EAST END (South Lode).—It has been decided on making a further trial in this direction, and the men are engaged, by way of a preliminary operation to further exploration, in taking down a portion of the south side, where the vein throws off a branch a few fathoms behind the present end.

THE 20 SOUTH-WEST END, advanced 9·5 ft., has improved since last advices, the vein being now worth 30 cwts. per fathom, and present indications give every reason to believe that a good range of ore ground exists ahead of the present forebreast.

SABANDIJA MINE.—THE 12 EAST END extended 9 ft. The vein has increased in width, and shows more mineral than at the date of last report, presenting a decidedly improved appearance.

THE 12 WEST END, driven 13 ft. During the month the vein became contracted to about half its former width, but is again opening out, and is likely soon to recover its former strength. In both ends the vein is very well defined.

SOUTH AFRICAN EXPERIENCES.—During the last South African troubles Mr. Charles Duval had some very lively experience in various parts of Southern Africa, including the diamond fields, in connection with which he has collected many assuming stories and anecdotes, and his observation that long before the outbreak in the Transvaal he had been told by Africanders that there were two faults in the British soldier—he was not mounted, and he could not shoot—may in a measure account for the lamentable failure of the British in that province. Mr. Duval has now taken up his position at St. James's Hall, where he shows in his excellent entertainment and impersonations—Odds and Ends—that he is not only a careful observer, but a clever mimic. His audience certainly pass a pleasant and profitable hour in listening to him.

JAPANESE MINERS.—Japanese miners have some curious customs, which sadly depreciate the value of their work. They do not, says the New York Engineering and Mining Journal, appear to appreciate the fact that "time is money." An engineer who has just returned from the mines of that country tells us that they light them in a peculiar manner. Every man entering the mine carries with him a large bundle of from 5 to 6 ft. bamboo cane, slightly beaten before use. This cane is used as a torch. It burns fairly well for a few seconds until a notch is reached, when the light nearly goes out, and the ashes must be knocked off, a process which must be repeated every half-minute. Every six or seven minutes a new cane must be lighted, so that a good share of the miner's time is occupied in keeping his illumination in a fairly satisfactory condition. Unfortunately Japanese miners are besides great smokers, and they use a pipe having a bowl the capacity of which is equal to that of an ordinary thimble. It takes two whiffs to finish if, when the process of filling up and lighting it must be gone through. Everyone has probably had occasion to watch the great deliberation with which an average Irishman when at work will fill his clay bowl when the foreman's gaze is not on him; but imagination simply shrinks from the task of picturing the rapid progress of work intrusted to a smoking Japanese miner.

THE TIN MINES OF PERAK.

Some two years since the French Minister of Public Instruction entrusted Mr. J. Errington de la Croix, Civil Mining Engineer and Officier d'Academie, with a scientific mission to Malasia, and a résumé of the notes he then took during a stay in Pérak of over seven months has now been issued as an extract from the Archives des Missions Scientifiques et Littéraires—Les Mines d'Etain de Pérak (Presqu'île de Malacca). Par Mr. J. Errington de la Croix. Paris: Imprimerie Nationale—and contains a large amount of information of paramount importance to all connected with the production of tin. During his sojourn in Pérak the author discovered very rich tin mines, and on his return to France succeeded in inaugurating a company with a capital of 120,000*l.* to work them. He has now returned to Pérak, and is busily engaged in putting up machinery and getting everything in working order. Two or three other companies (Australian) are also starting works in the region, and it is not doubted that if the country were better known in England and France capitalists would find it a remunerative field for enterprise, since its mineral wealth is incalculable, and the local government is ready to support any new comers who really mean business. The application of capital to the development of mines in this part of the world would, it is confidently believed, be equally advantageous to investors and to the State. Thus far tin mining alone seems to have received serious attention; but the progress which has been made with this cannot but afford great inducements for trials in other directions. Two years ago, and that is the date to which Mr. Errington de la Croix's book reaches, the mining population, consisting almost exclusively of Chinamen, was 20,000; at present it is over 45,000 men; and the total production of metallic tin for the year ended Dec. 31 was 110,000 pikuls, or about 7000 tons.

From time immemorial the accounts given by travellers have referred to the metalliferous riches of Malasia, and ancient historians speak of an active commerce carried on long before the Christian era between the people of India and the Western countries, Arabia, Egypt, Greece, and others; and Mr. Errington de la Croix points out that Sacred History tells us that the fleets of King Solomon started from the port of Ezion-geber, in the Red Sea, for the land of Ophir, whence they returned after a voyage of three years with products which could not have been obtained except in the islands of Southern India. Learned commentators have placed this El Dorado in the islands of Sumatra, formerly known as the Golden Island, and modern travellers have collected evidence which seems to add some weight to that opinion. The peninsula of Malacca was quite as well known as its neighbour, and was not less celebrated for its mineral riches, for it figures in the maps of Strabo and Ptolemy under the significant name of the Golden Chersonese. Amongst all the metalliferous products of the district gold and tin appear to have been the subject of an important trade, and tin, which at the present moment is chiefly under consideration, seems to have been particularly worked in the kingdom of Pérak—indeed, all travellers are unanimous on this point. After sketching the geographical situation and topography of the region, Mr. Errington de la Croix states that the climatic conditions of the country are excellent, much better, moreover, than in the southern regions of the peninsula, where the fen which surround the town of Malacca have secured a sad reputation for this part of Malasia. With regard to the political situation he remarks that the kingdom of Pérak was absolutely independent under the domination of Sultans and some chiefs, of which one of the most influential was the Mountri, or governor of Larout, specially charged with maintaining order among the miners, and with getting in the taxes for account of the Sultan. The work in the mines was but little suited to the idle and indolent character of the Malays, and hence the governors of Larout, desirous to augment the revenues of the State, of which they formed a large item, encouraged by all means in their power the immigration of Chinese miners. These arrived in very small numbers at first, and were chiefly composed of fugitives who had taken part in the great revolt at Thaïpeng, in China, or criminals flying from justice in their own country. These came and laid the foundation of the Chinese town, to which they gave the name of Thaïpeng, and which is now the commercial capital of Pérak.

At first all went on well. The mining region was vast, and the few miners working peaceably side by side thinking of nothing but of making their fortune. But this state of things did not long continue, for as the news of the rich discoveries made at Larout became spread, new bands, numerous and rapacious, arrived from the Celestial Empire, and the country soon became involved in discords of all kinds. There was no law for regulating the working of the mines, and even if there had been one the Mountri had not at his disposal the necessary force for applying it, and maintaining order in a turbulent and fighting population, which in 1871 had reached the number of 10,000 souls. Each new arrival chose a plot where he liked, and worked it as he liked, troubling himself little about the damage that he might cause to his neighbours, hence continual disputes arose which degenerated into sanguinary conflicts. The miners separated into two camps—the Sé-Kwang and the Go-Kwang—under the direction of two experienced captains; a regular war was organised, which went on daily without truce or repose. The Mountri, watchful of his interests, joined the strongest—the Sé-Kwang, who one day completely repulsed their rivals, and remained masters of the place. This was at the beginning of 1872. Some months later—in the following autumn—the Go-Kwang landed again, more numerous and more rapacious than ever; they had procured improved arms, cannons, and had even brought from China at great cost special warriors to defend their cause. They attacked the Sé-Kwang, and beat them completely in a terrible war, wherein there perished, it is said, 3000 Chinese. The conquered took to flight, bought vessels, became pirates, and blockaded the coasts of Pérak. The Mountri, still looking after his own interests, abandoned his old friends, and declared in favour of the conquerors; but the Sultan saw that he could do nothing against these discords, and solicited the support of the English Government. The English sent some ships of war, which soon cleared the coast of pirates, and at the request of the Sultan an English resident, Mr. Birch, was placed at his court, whilst an assistant resident was charged to maintain order at Larout. England then withdrew her vessels, after being compensated for her assistance by the cession of the island of Pangkore, and of a strip of land opposite, on the coast of Pérak. From this time the Chinese were more tranquil; but it was not so with the Malays, and ultimately dissensions arose at the court, culminating in the assassination of the Resident on Nov. 2, 1875. The Sultan and the Mountri of Larout, being compromised in the matter, were banished to Seychelles English, established a protectorate, and entrusted power to Rajah Mouda Yusuph, the heir presumptive, who took the title of Regent.

Mouda Yusuph is the present sovereign; by his side, aiding with his knowledge and counsel, is a new Resident, Mr. Hugh Low, whose great ability and perfect acquaintance with the Malay character are guarantees for security and progress. The chief direction and control of the affairs of the country belong to the Straits Settlements Government at Singapore. A Council of State, presided over by the Rajah Mouda, and composed of the Resident, assistant resident, and some Malay and Chinese notables, is charged to ascertain the wants of the country and frame the laws. The different districts are placed under the administration of European functionaries, there is an armed body of police, roads have been constructed, rivers made navigable, and postal and telegraphic communication established between the principal points. Under this impulse the mining districts of Larout have been considerably developed, and others still richer have been discovered in the Kinta region. The Chinese population, abondoning their belligerent humour, have set seriously to work, and now the little State of Pérak is in a fair way to become the most important tin-producing centre in the world.

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